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Corroyer's "Gothic Architecture."

IF we do not learn to understand Gothic architecture it will not be for want of new treatises and new theories on the subject. The new theories are in fact almost a necessity now for anyone who wishes to produce a book on Gothic architecture. What may be called the central and the sound view of the subject, in regard to the history, development, and essential characteristics of this school of architecture, has been so much dwelt upon and illustrated, that except in regard to additional drawings of examples not hitherto well known, or not before published (which are always welcome), there seems no room for a new author to say much unless he has a new theory to advance. Thus we had not long ago the book by an American professor, Mr. Moore, in which it was attempted to show, for the first time in a treatise in the English language, that Gothic was a purely French architecture, and that nothing out of France had any claim to be called Gothic at all, or to be regarded with any respect. This has been for so long the expressed opinion of French architects (as we have observed from time to time in noticing the successive volumes of the "Encyclopédie de l'Architecture"), that this resource for novelty of view is completely cut off from them; it has long become only a parrot-cry. So accomplished a student and practitioner of Gothic architecture as M. Corroyer, whose name is, we hope, familiar to our readers as one of the most learned and capable of the French architects of the day, must therefore look for some other means of giving individuality to his book* on Gothic architecture.

This special feature which characterises his book consists in the theory of the origin of the Gothic form of vault. This has generally been regarded as the natural descendant, through the Romanesque buildings, from the quadripartite vault of the Romans, gradually modified and elaborated under the influence of the practical difficulties presented by the round arch in the first instance, and by the manipulation of ribs of necessarily differing curvatures starting from and meeting at common points. The steps of this development are so obvious and follow so naturally on one another, that a comprehensive review of the past history of Romanesque and Gothic architecture seems to show us the whole process in operation before the mental eye. But M. Corroyer rudely disturbs all this panorama of the history of the Gothic vault. Apparently such an origin was not sufficiently French for him. His endeavour is to show that the Gothic vault developed from a class of buildings which in one sense are peculiarly French, though they have hitherto been regarded as strongly influenced by Byzantine architecture; viz: the early domical-roofed churches of the type of Angoulême and Perigueux. The general idea that St. Front at Perigueux is suggested by St. Mark at Venice, M. Corroyer scouts:—"The cupola of St. Front, which we may reasonably call the mother cupola of France, was not an imitation of that of St. Mark at Venice, for both were based on the church built by Justinian at Constantinople, in honour of the Holy Apostles. But the form thus imported into Aquitaine received such modification and development, as to make it virtually an original achievement." Having thus claimed the Aquitainian architecture as practically French, and denied any indebtedness to Italy, we have next to show that the whole system of Gothic vaulting sprang from these domed churches, and that thus the Gothic style radiates from the South of France. If the reader naturally asks what is the connexion between the domed roof of St. Front and the cross vault, he is told that it is to be found in the pendentive of the cupola, which "gave birth to the intersecting arch, which is the main feature of so-called Gothic."

In what sense it can possibly be said that the Aquitainian cupola gave birth to a feature which had existed since the days of the Romans, and been repeatedly put in practice in Romanesque architecture, it is difficult to understand. M. Corroyer seems in part to be led away by the similarity between the aspect of a dome pendentive and that of a severy of a vault. In a certain sense they are similar, but they are performing very different architectural functions. The plea upon which the author gets rid of the responsibility of the Roman and Romanesque vault in leading up to the Gothic vault is, that the Roman intersecting vault had no built or constructive rib, but "the stones at the line of intersection were in complete solidarity with the filling on either side in which they were buried." True enough, but surely there is some similarity between a Roman or Romanesque quadripartite vault without a groin-rib, and the early Gothic quadripartite vault with a built groin-rib. The method of construction is different in detail, but the main principle and the main appearance are the same; whereas both the constructive principle and the aspect of a domical roof are perfectly different. Mr. Corroyer's idea seems to be that the pendentive is the same thing as the later vault severy, because its surface or filling is bounded at either edge by a constructive arch, like the constructive arch which forms the rib in complete Gothic vaulting.

"The identity of function in the pendentive and in the Gothic intersecting arch, both constructed as they are of stones dressed* normally to their curves, shows that thay sprang from a common origin, which is as much as to say that the Aquitainian cupola begat the intersecting vault."

M. Corroyer seems to forget that if the cupola were erected over a square of solid walls, the pendentive would have no such bounding arch and "set up normally to its curve," it would simply represent the same thing (in another position) as the vaulting-

* "Gothic Architecture": by Edouard Corroyer, Architect to the French Government and Inspector of Diocesan Edifices. English translation; edited by Walter Armstrong, director of the National Gallery of Ireland. London: Seeley & Co.; 1893.

* We have not had an opportunity of comparing the original with the translation, but if, as we suspect, "dressed" represents "dressés" in the French, it is a very naïve blunder on the part of the translator. "Dressé" would mean "placed" or "set up," which is the obvious meaning of the author; "dressed" has no sense at all in the sentence as given by the translator.

surface of a vault, apart from the vaulting-rib. In short, instead of regarding the vaulting-surfaces and ribs of a complete Gothic vault as an elaboration of the normal intersecting vault, he seems to regard it as a series of pendentives placed in juxtaposition at different angles; ignoring not only the distinction between the genesis of the two forms, but the important fact that the predentive is a device for carrying the weight of the cupola, whereas the vault-severy carries nothing but itself.

The architectural world in general has long regarded the type of architecture shown in the Aquitaine churches as a special local phase of architecture, having a remarkable similarity with Byzantine work, and illustrating in a very marked and picturesque manner the former prevalence of a special local Byzantine influence in the district, arising from causes which one cannot now clearly define. It has always been regarded as a special chapter of French architecture, standing apart from the main progress of Romanesque and Gothic architecture, into which latter it was very soon absorbed; that is to say, the semi-Byzantine style of Aquitaine reached no high development, and only exists in buildings of a very early Mediæval date. We are now asked to regard this exceptional phase of early French architecture as the central point of the whole, to ignore (almost) its essentially Byzantine character, and to treat this dome-roofed architecture as the starting-point for the development of a vaulted-roof architecture which has no resemblance to it in construction, but has a direct resemblance to the vaulting of Roman and early Romanesque architecture—and all this paradox in order to find a purely French origin for Gothic architecture.

It is to be regretted that this paradoxical view of the origin of Gothic architecture should be given such a prominent place in a book which in every other respect is an admirable one. The chapter to which we have taken exception forms but a small proportion of the volume, but it is the leading feature and is evidently intended to be the key to the whole, and therefore we have felt bound to give special prominence to it. The illustrations to the book are numerous and mostly well executed, and sections of construction form a large proportion of them. The chapter (V.) on the origin of the flying buttress is excellent. Chapters VI. and VII., on Churches and Cathedrals of the twelfth and thirteenth centuries, collect together a number of sections which are of great interest for comparison, especially in regard to the treatment of flying buttresses. In speaking of the section of Beauvais, the author draws attention to the peculiar hardihood of the builders in seating the intermediate buttresses, midway between the centre aisle and the large external buttresses, to a great extent on corbelling within the line of the piers which form their proper supports. As he observes, the wonder is that a building so put up should have stood at all. In the following chapter, on cathedrals of the thirteenth and fourteenth centuries, some consideration of some of the English Cathedrals is grudgingly admitted. Anything which is admirable in them is put down to French influence, including the choir of Lincoln, which is perhaps about as thoroughly English a piece of architecture as could be found. This kind of special pleading is tolerably harmless in the English translation, as any one in this country whose opinion is worth anything knows how much to believe of it; but it is annoying to think of these statements circulating in France, where no one, comparatively speaking, travels or makes use of his own eyes in studying such buildings, and where all this foolish and one-sided depreciation of English Gothic will probably be received as gospel. "The vast and magnificent Cathedral of Lincoln," we are told, "is an admirable subject for comparative study. Its architecture combines most strikingly the characteristics of the two nations. It blends in one harmonious whole the massive solidity of the English structure overlaid with detail, formed by lines vertical, rigid, and hard as iron, and the mingled grace and strength of French architecture, which may fitly be compared with gold, in its union of the supple and durable, of solidity and power of resistance equal to those of the less precious metals, with an adaptability to artistic ends far greater." Where is this French influence in Lincoln? The supposed English hardness is certainly shown in the illustrations given, which seem purposely drawn in a style different from the drawings which illustrate French architecture. It is worth note that the author has nothing at all to say about the finest characteristic of English cathedrals, their large centre towers; a feature which, as Fergusson has remarked, the French builders deprived themselves of by their over-ambitious efforts at loftiness and slenderness in the supports of the lower structure, leaving nothing for a tower to stand on, thus missing entirely the fine composition afforded in so many of our cathedrals, of the dominant central tower and the minor western towers, and having to content themselves with a mere flèche at the crossing. Surely such a feature as the central tower is no small compensation, to say the least, for the comparatively limited height of the English cathedral.

In the chapter on sculpture, very fully illustrated, we find the same almost exclusive attention to French work, which indeed in such statues as those of Rheims is superior to most English work; yet certainly some reference might have been made to Wells, particularly to the resurrection sculptures, which are at least work done on English ground, though perhaps their English execution may be questioned. If not by English hands, however, they are Italian rather than French. And if the author admires so much the leafage sculpture from Mont St. Michel, he might have found at Wells examples of this kind of work of even finer style. In his remark as to the influence of Roman sculpture on French Mediæval work the author is probably right; certainly the treatment of the drapery in the examples from Rheims given on page 156 bears out the idea, as does even the very attitude and pose of the figures.

In the chapter on abbeys and monastic institutions there is a great deal of valuable observation and illustration collected in a small space, especially in regard to the great pile of building on Mont St. Michel, on which the author's observations are of special value from the fact that he was for a long time its architectural custodian, until unworthily removed from his post by the bigotry of the present anti-ecclesiastical French Government, as an architect of too Mediæval a turn of mind to satisfy an enlightened modern people.

A much larger proportion of the book is devoted to military architecture than is generally the case with books on Gothic architecture, and this portion is largely illustrated with plans and sketches of buildings which are not so much known in England as the ecclesiastical buildings. Some of the author's remarks in connexion with this part of the subject have a special interest for us at present. M. Corroyer believes in the architect as a scientific constructor, and "protests against the degradation of the architect from his high and noble estate to the rank of a mere decorator, however skilful." He observes on another page:—

> "The system by which the architect and the engineer have each their separate functions and responsibilities in the construction of the same building was unknown. The builder, or mason, as some would have him called, was an architect in the fullest sense; he himself traced the diagrams of his conceptions, and directed the execution of every detail, careful alike of stability and beauty.
>
> It is a curious and disheartening phenomenon that such a direct contravention of the principles of Mediæval art as the modern system of divided responsibility implies, should obtain only among the French, the very people to whom Western Europe owes its initiation into those principles. In England, in Belgium, in Holland, Switzerland, and Germany, the architect is also the engineer; the science and art of his craft are inseparable."

The statement that this is so "in England" is another example of the author's want of acquaintance with this country, since otherwise he would have been aware that there are a number of people here who wish to dissociate the architect altogether from that class of responsibility which may be said to come under the head of engineering, and to reduce him to the rank of "a mere decorator." The opinion that it is the architect and the engineer, rather than the architect and the sculptor, who should be united in one profession, is one that we have more than once expressed lately; and we are glad to find an eminent French architect in concurrence with us on this head, however much we may feel constrained to differ from him on some other points.

In fine, with the exception of the peculiar paradox with which the book sets out, and which to some extent discounts its value, this is an admirable little treatise, written by one who is a thorough architect, calculated to interest alike both the amateur reader and the architectural student, and one which should be read by every one who is about to visit France for the study of her Mediæval architecture; always bearing in mind that the book must be read and regarded not as a work on "Gothic architecture," but on "French Gothic architecture." We may add a word of praise for the very judicious notes inserted here and there by the editor, which are calculated to set right, for the English reader, some of the peculiarly French ideas and prejudices of the author.

THE CONSOLIDATION AND AMENDMENT OF THE HIGHWAY ACTS.

THE better management of local districts has been a prominent subject of legislation during the past few years. It is hardly necessary to point to the establishing of county councils, and to the several Acts relating to sanitary matters as examples. It is therefore high time that the Local Government Board took in hand the consolidation and improvement of the existing Highway Acts. It may be said that this question must stand aside until either parish or district councils are established. But the highways have to be managed whether such councils are in existence or not, and if a good code of highway law were in existence any legislation on the subject of parish or district councils could have reference to such a code.

There is no subject which needs a clear and sensible code of law more than highways, because they have to be managed by ordinary persons who are not lawyers, and therefore it is essential that the law in relation to them should be stated in clear terms and in a harmonious form. At the present time there is far from being that one clear code; on the contrary, highways are regulated by a number of confused Acts of Parliament. There is, first of all, the General Highway Act, 1835, which is the principal statute on the subject; there is next the Highway (Better Management) Act, 1862. This statute was followed by one in 1863, to prevent waywardens from contracting for works within their district, and, in the following year, by one known as the Highway Management Amendment Act, 1864. This was succeeded, in 1878, by another Amendment Act, and, in addition, there are other statutes on the same subject, such as those which deal with the use of locomotives on highways and with the duties of auditors. It has to be remembered, also, that, in addition to this mass of statutory law, there is a considerable quantity of common law and judicial dicta, which also form part of the general highway law of the country; such as that in reference to the indictment of a parish for the non-repair of highways; since it is by the common law of England, and not by force of any

statute, that a parish can be indicted for the non-repair of a highway. The first requisite in legislation on this subject is, therefore, the consolidation of the law relating to highways in a single statute which shall incorporate all that is useful in the existing statutes, in the common law of the land, and in judicial decisions. But the two chief statutes to which we have already alluded, namely, the Act of 1835 and that of 1862, contemplate two different highway authorities. The old Act looks to the parish as the highway authority; the later statute was not only intended to regulate highways, but enabled highway districts to be formed, consisting of the whole or part of a county, and of several parishes, and, in places where a Local Board of Health exists, by that body. It is certain that, for the efficient management of highways, the election of a surveyor or surveyors by a vestry, consisting of perhaps half-a-dozen persons in addition to the clergyman, is a bad mode, and in every single parish or in every union of parishes a highway board should be elected. Should a measure be ultimately passed by the legislature for parish or district councils, these bodies would simply take the place of the highway boards, and the code of law relating to the management of the highways would be applied by the parish or district councils. It would probably be advisable to have the code of management in a separate statute from that which regulated the formation of a highway board, because main roads which are under the control of the county councils would be administered by these bodies under the code of highway law, just as they are at the present time under the existing body of statute, certain to judge-made law. The fact that county councils have now to administer the main roads of the county under the existing jumble of law is a pressing reason for the codification and amendment.

In regard to this latter point, a considerable number of details have to be considered, and it is impossible to do more than have a glance at some of them. One of no little importance is in regard to the widening of highways; it is the duty of a highway authority to keep existing roads in repair, but there is no obligation on it to widen a highway which has become too narrow for existing traffic. But at the present time, however necessary such work may be, it is more than doubtful if a highway authority can be compelled to undertake it. In any new statute a specified number of ratepayers should have the right to call on a highway authority to widen a road, and in case of refusal there should be an appeal to the county council. The same procedure should also exist in regard to the making of footpaths, work which is far too much neglected all over the country. Again, when we turn to the subject of pruning hedges, we find that "no person shall be compelled, nor any surveyor permitted to cut or prune any hedge at any other time than between the last day of September and the last day of March." It is impossible to have dry, sound roads unless hedges and banks are well trimmed, yet for six months in the year there is no power by the law, as it exists, to keep hedges from injuring roads and even inconveniencing passers. Nor can roads be conveniently used unless clear and legible sign-posts are placed in all necessary places. But by the twenty-fourth section of the principal Act, when a new sign-post is required, the surveyor must obtain the consent of the inhabitants in vestry assembled, or receive the direction of the justices who have sat at a special highway sessions. In other words, an ordinary and necessary administrative Act requires the sanction of the electorate body, or the special mandate of a body of magistrates. The natural consequence is that in many districts sign-posts are conspicuous by their absence, because the surveyor naturally does not take the trouble to assemble a vestry to authorise him to do a work which would not give the village carpenter a day's labour. Of course, the authority to put up such posts should be part of the general authority of the highway officials. These are but a few of the details which require amendment in the existing law; to give others seriatim would answer no useful purpose. The fact is that the existing body of highway law is inconvenient and confused in form, and unsuited to the changes which have occurred throughout the length and breadth of the line. It is not in its present form fitted for localities which are becoming more populous, and whose character is changing; and it is incomprehensible in its language to most of those who have to administer it. Its co-operation and amendment are a pressing need, alike for the benefit of purely rural districts as well as of those which have become more populated, and which, without having become quite urban localities, are somewhat removed from places of arcadian simplicity and arcadian mud.

NOTES.

THE fact that a large number of persons of all nationalities will visit Chicago this year, unless Cholera puts a substantial veto on the proceedings, renders the sanitary condition of the city a matter of wider importance than usual. It is satisfactory, therefore, to learn that the mortality records are improving, according to a return made by the City Health Commissioner. In 1891 there were 27,754 deaths, in 1892 but 26,073, a deerease of 1,681. The early date at which the returns are published speaks well for the promptness of American officialism, even when we learn that the average for the last fortnight in the year is an assumption. The decrease is largely accounted for by the improvement under the heading of zymotic diseases, and of these the loss from typhoid fever has shown marked diminution. The suggestive note is added that the new four-mile water intake tunnel has just been put in use. The reputation of Chicago has not always been of the highest in this respect, the city having been accused of spreading typhoid germs even so far afield as St. Louis, and the improvement promised is, therefore, additionally welcome.

WE drew attention a week or two ago to the discovery of a reservoir at Athens which Dr. Dörpfeld, from its site and general character, announced to be the long sought Enneakrunos. This statement was not likely long to go unchallenged. The *Berliner Philologische Wochenschrift* for January 14 says (we translate): "It is demonstrated without possibility of doubt that at this spot there was situated a reservoir intended for general use; it is not demonstrated, as the Hestia and Ephemeris assume, that the reservoir is the Ἐννεάκρουνος of the Peisistratidæ." Unfortunately, the *Wochenschrift* gives no better basis for its scepticism than the statement that Pausanias and Thucydides say that the "nine-piped spring" lay in the neighbourhood of the Ilissos, a mere revival, in fact, of the old, out-worn literary controversy as to what they saw and what they knew. Some further and more profitable details are given, however, which deal with facts not with hypotheses. The "find" near the Panathenaic road may have been quite unlooked for. Dr. Dörpfeld has come on two primitive graves, one of which, the grave of a child, contains vases of the Mycenæan type. The second contains remains of a partially cremated corpse, and, which is important, cremated *in the grave itself*. We have, therefore, an analogy in Athens itself to the graves found in Eastern Attica (at Varna). Possibly it was this *pro formâ* partial cremation that had been carried out in the "shaft graves" of Mycenæ.

THE proposal to improve the west end of Cheapside, which is now before the City Commission of Sewers was advocated a few years ago by Mr. Edwin de Lisle in "The Majesty of London" (1885). On February 13, 1886, we reproduced two plans from Mr. de Lisle's book, together with his remarks upon them, to illustrate his scheme for *inter alia*, widening the roadway from Cheapside and St. Martin's-le-Grand into St. Paul's churchyard. A memorial presented to the Commission at their meeting on the 10th inst., asks for the demolition of the houses north and south of the east end of Paternoster-row. Mr. H. H. Bridgman, upon whose motion the memorial is referred to the Finance and Improvement Committee, is reported to have said that it is computed 30,000 vehicles and 100,000 pedestrians pass daily where the average width between the buildings is 44 ft., and only 28 ft. between the kerbs; and that the cost of the improvement would be 100,000*l.* at least. The houses in question stand in the parish of St. Michael-le-Querne, and on part of the site of the church; known also as St. Michael ad Bladum, or at the Corne; which was not rebuilt after the Great Fire. The original church, taking its name from the corn market there, was built *temp.* Edward III., rebuilt or enlarged in 1430, and repaired by the parishioners in 1617. Here were buried Thomas Newton, first priest (in the choir, 1361), Leland the antiquary, and John Bankes, the wealthy mercer, *obiit* 1630, whose daughter Anna married Edmund Waller, the poet. At the church's east-end,—where is now Sir Robert Peel's statue,—stood the Old Cross, taken down in 1390, and replaced in 8 Henry VI., with Lord Mayor William Estfeld's conduit, called the Little Conduit, in (West) Cheap, by Paul's Gate.* Some consider that the sculptured figure of a boy seated on a pannier in Panyer-alley, and dated "1688," is the successor of the "Hwaetmundes stane," cited in King Alfred's reputed grant, 889, of land here to Werefrith, Bishop of Worcester, for a market. Whilst "maund" is another term for a large basket it seems more likely that the "antiquum petrosum aedificium" of the grant refers to a stone structure at this spot of one Hwaetmund, than that the old English *mand* or *mond* (basket) should appear as *mund*.

MANY champions on either side have now entered the lists in the revived railway rates tournament,—Board of Trade officials and railway officials, Sir James Whitehead (on behalf of his militant organisation, the Mansion House Association on Railway and Canal Traffic), Mr. Acworth, ever ready for a bout with critics of railway management, and Dr. Hunter, who, like Mr. Acworth, has "written a book" on this, just now, prominent subject. Perhaps it is scarcely fair to say that Dr. Hunter "entered the lists," as he was pressed into the controversy by the insatiable interviewer. Professor Hunter, in saying that he was not in the least surprised that the result of the revision of rates is not satisfactory to the traders, only repeats the opinion he formed and expressed before the Board of Trade inquiry was commenced. He wrote in February, 1889, "The traders, if they do not watch closely the proceedings about to be initiated, may find out that they will lose much and gain little by the symmetry and uniformity which are to take the place of the chaos of the old special Acts." The traders certainly did watch the proceedings closely, as did the Board of Trade, and also the Parliamentary Joint Committee, of which Dr. Hunter was a member; but the result is, at present, decidedly discouraging. The outcry still continues; even Ireland,—where the existing rates were always regarded as constituting a very heavy burden,—joining in with complaints of increases amounting to 30 per cent. Mr. Acworth is not always in accord with Professor Hunter, but two years ago he expressed his "firm persuasion that the present settlement can settle nothing." Dr. Hunter's remedy for the injustice which

* For the conduit and church *see* Mr. H. W. Brewer's view of "Cheapside in the Time of Henry VIII." published in the *Builder* of February 2, 1884.

fixed *maxima*, however carefully adjusted, seem bound to entail, lies in conferring upon the Board of Trade still higher powers in determining the "reasonableness" of rates. Perhaps when Parliament re-assembles it may be called upon to consider this and other proposals for dealing with the problem. In the meantime, traders are seriously endeavouring to arrange for water-carriage in several parts, the railway managers find it necessary to hold daily meetings at Euston to investigate complaints, and even the organs of the Money Market (which may be taken as indicating the views of shareholders) are urging the desirability of granting timely concessions.

OWING to the present premises of the Bavarian National Museum at Munich not being large enough, as well as on account of structural defects, the Bavarian Government decided some time back to erect a new building, at a cost of some 250,000*l*. An open competition for the design was expected, but the authorities apparently intend to take the unusual course of forming a Special Commission of curators, artists, architects, Government officials, and prominent citizens, who are to give instructions as to the kind of building thought advisable, and to have preliminary sketches made under their supervision. The Munich *Allgemeine Zeitung* and the South German provincial Press say that there is much feeling in the Bavarian art circles at this mode of procedure, and apparently no good results are expected from the deliberations of the Commission. A competition would have cost the Government 1,000*l*. in premiums, but a small sum compared to that of the proposed building, and in Germany it should be remembered that competition assessors do their work *honoris causâ*, and not for fees.

THE case of the Leyton Local Board *v.* Causton, decided on Saturday last by the Queen's Bench Division, was one of such a simple character that it is surprising the Court of First Instance should have come to a wrong conclusion. The third section of the Public Health Act, 1888, says that it shall not be lawful to erect any building in any street or road beyond the line of the front main wall on either side of it. The respondent, who owned a corner house, built it 7 ft. beyond the front line in either street, and when the Local Board brought the matter before the magistrates, the latter decided in favour of the building owner. The higher Court observed that the case was practically unarguable; in truth, the building owner's contention was really ridiculous. The case should be noted, but there is no more to be said about it.

ON Thursday, the 12th instant, Professor Silvanus Thompson delivered the first of a series of three lectures at the London Institution on Electric Lighting. The lecture was entitled "Generation of Electric Currents," and Professor Thompson chose the historical method of treating it. Beginning with the remark that a hundred years ago the only known method of producing an electric current was by turning the handle of a frictional machine, he, with a graceful allusion to Sir George Grove's work at the Institution, briefly noticed the discovery of the electric battery, and Sir Humphry Davy's use of it to produce an arc. He explained how the expense of the fuel (zinc) used in a battery prevented this method being of any great commercial importance, and passed at once to Faraday's great discovery in 1831 of the mechanical means of generating electric currents by the motion of a coil in a magnetic field. With the remark that Faraday, as was his custom, left to others the development of his idea, the lecturer proceeded to show, with the aid of lantern slides, how this had been accomplished, noting the main points of advance from year to year,—the magneto-machines of Clark and Sir William Sturgeon, the introduction by Wheatstone of successive coils to give a continuous current, the introduction of subsidiary electro-magnets by Hyorth and Holmes, and the further advance by Wilde, who used electro-magnets excited by a small magneto-machine, leading to the nearly simultaneous discovery by Wheatstone, Varley, Siemens, and Ladd of self-exciting dynamos. At the same time he traced the development of the commutator from a mere split tube to its present form. Professor Thompson then passed on to modern machines, from the Gramme of 1870, through a long list, including Gordon, Westinghouse, and Edison machines, down to the Mordey alternator and the large Ferranti dynamos at Deptford; and it speaks much for his skill in interesting his audience that their attention did not flag as a long succession of but too familiar illustrations appeared on the screen. There was no attempt to go into details, rather the unity of principle was insisted on, whether the current were direct or alternating, whether the coils or the magnets rotated. In conclusion, an ordinary arc light was lit by the alternating current from Bankside, the lecturer showing that its light could be varied by a regulator; and a glow-lamp in the circuit of a small coil was lit by placing the coil over an electro-magnet excited by the same current. This last experiment was greeted with enthusiastic applause, which shows the advantage of reticence. Had the audience been told that the arrangement was merely a highly inefficient open circuit transformer, they would hardly have been so impressed. The lecture was evidently not intended for students or *employés* in electrical works, who would find little new to them in it, but rather for a public with no previous knowledge of the subject. For such it was well adapted, and quite within their comprehension; and, doubtless, most present went away with a much clearer notion than they ever had before as to how electric currents are generated.

THE long-expected judgment in the case of Hopkinson *v.* The St. James's and Pall-Mall Electric Light Company was pronounced last Saturday, by Mr. Justice Romer, in favour of the defendant. The judgment is a model of lucid, and,—despite Mr. Justice Romer's modest disclaimer,—scientific statement of the facts and points at issue. Since the infringement is undisputed, the whole question turns on the validity of Dr. Hopkinson's patent of what is generally known as the "three-wire system." The judgment deals first with questions of the wording of the specification, and decides that it was, when fairly read, intended to refer to the constant potential method of supply. The next point is that of anticipation, of which it was contended there were three principal examples, viz., the Sauchie Hall, the Alexandra Palace, and the Inchigore installations. With regard to the first of these, the facts were disputed, and the learned judge considers that the evidence of the defendants broke down, otherwise "an anticipation would have been established." The other two cases are regarded "as not belonging to the parallel system at all," and not coming within the plaintiff's specification, since, "the central wire cannot fairly be said to carry away excess of electricity between lamps on one side and lamps on the other." Mr. Justice Romer has a high opinion of the intelligence of the British workman since he thinks "that any workman of ordinary skill who would be employed to put up the dynamos to be used in accordance with the plaintiff's specification would know that the dynamos to be worked in series with alternating currents must keep time, and that the ordinary method of effecting this would be rigidly coupling the dynamos." We venture to think that a workman who should have come from works where direct current was used on the three-wire system would, at that time, have been almost certain to couple the dynamos, direct or alternating electrically, not rigidly. The last point dealt with is highly technical, both from the legal and electrical points of view. It concerns the regulator, which Mr. Justice Romer calls a "potential measuring machine" (showing that in this part of the case he has failed in his usually clear grasp of technicalities), and with regard to it there was great difference of opinion between experts of the highest attainments and indisputable integrity. On the one hand were called Lord Kelvin, Dr. Hopkinson himself, and Dr. J. T. Bottomley, who all testified that the regulator would work with an alternating current. On the other hand, Mr. J. S. Swinburne, Mr. W. M. Mordey, Mr. Hugh E. Harrison, and Professor Silvanus Thompson gave evidence that, under ordinary conditions, it could not so work. To the ordinary lay mind it seems strange that the failure of an unimportant detail should invalidate the whole patent; and perhaps this feeling was unconsciously at the bottom of the learned Judge's decision, together with a suspicion, clearly suggested by the plaintiff's side, that the experimental regulator put in evidence by the defendants had, to use his own expression, been constructed with perverse ingenuity so as *not* to work.

IN the volume of the Proceedings of the Institution of Civil Engineers, just issued, a description is quoted of the manner of mixing the cement, to form test briquettes, pursued by the Engineers of the St. Louis Waterworks, where some large additions have been recently made, in the carrying out of which a great quantity of Portland cement was used. The method appears to recommend itself from the fact that it gives more uniform results than hand mixing, and it is said that with the apparatus described two dozen briquettes can be turned out in an hour. The cement was tested neat, and most of the mixing was done by means of a machine called a "jig," the principle of which is very simple. Sufficient cement to form one briquette is put into a cup, the proper proportion of water is poured on the cement, and a tight-fitting cover put on. The charged cup is then shaken violently at the rate of 500 to 800 oscillations per minute, until the cement and water are thoroughly mixed. The frame upon which the cups are fixed moves vertically, and is actuated by a crank. The cups themselves are of brass with covers ground to fit accurately, and on the top of the covers a steel plug is inserted to withstand the abrasion of the tightening screws. The inside of both cup and cover is finished very smooth, so that the cement will not adhere. The cement is first passed through a coarse sieve to remove chips and other impurities, and 135 grains are weighed into each cup; 8 drachms of water are then poured into each cup. The cups having been fixed upon the jig by means of thumb screws the flywheel shaft is turned at about 500 revolutions per minute for about a minute and a half. The contents of the cup are thus formed into plastic balls quite soft on the surface, but of a consistency of soft putty within, and they can be pressed into moulds.

AN American electrical paper states that constant complaints are received by water corporations of leaks occasioned by the corrosion of water-pipes caused by ground currents of electrical circuits; and it is even said that in connecting gas mains arcs have formed between the ends of pipes. The West End Street Electrical Railway of Boston has lately been called to order on this account, the water-pipes of the city being said to be much affected in the matter of corrosion by the influence of the current generated to work the line. The electrician to the railway has pointed out the desirability of metallic returns; and it has been suggested that a provision to this effect shall be inserted in the legal instrument empowering future lines to lay tracks for

electric street railways. Now we are promised (or threatened with) more electric railways in London the matter is worthy of attention, even if the lines proposed are not intended to run on the surface.

HERR REINHOLD BEGAS seems to have unexpectedly satisfied his critics with his last design for the National Monument to the Emperor William I. The teams of horses and menagerie of wild beasts have disappeared from the design, as also the portraits of men of the time (perhaps this is owing to the present position of Prince Bismarck, who must have had the prominent place among such a group), and the design now includes only a portrait statue of the Emperor and some symbolical figures. The monument will be about 21 mètres high. The model exhibited is one-eighth of the actual size.

THOSE of our readers who intend visiting Italy this spring may be interested to know of the programme of lectures (always generously thrown open to the public of all nations) to be held this year, under the auspices of the German Archæological Institute (Roman Section). From January to April a course will be held weekly in the Capitoline and Vatican collections, chiefly in Latin epigraphy. These lectures will be given by Herr Hülsen, the second secretary of the Institute. If sufficient applications are made he will also repeat in May, in somewhat briefer form, the course given in November and December of last year on the topography and monuments of ancient Rome, with special reference to the Campagna. During the spring, but at dates not yet precisely fixed, excursions will be made for the purpose of studying *in situ* the antiquities at Nemi, Ostia, Palestrina, and Corneto. These will be conducted by both secretaries. Finally at the beginning of July Herr Mau will hold an eight days' course at Pompeii. There could be no more competent guide to Pompeii than Herr Mau, but even his instruction might be dearly bought by eight days' exposure to the Neapolitan sun in July. Probably this course is intended for sun-proof Italians. As to Athens, Dr. Dörpfeld this year wisely limits his class in April to Peloponnesos to twenty, so that early applications are the more needful.

CHESHUNT has been holding a rejoicing over the restoration of its Eleanor Cross. The cross seems to have been restored in 1834, with the best intentions no doubt, but in such a manner as to remove much of its original interest and value as a Mediæval relic. Mr. Ponting, the architect to whom the present further work has been entrusted, seems to be much of the same opinion, as he recommended in his report that any renewals should be confined to those parts which had totally disappeared, and stated that the monument had suffered less from time than from neglect and injudicious repair. We should have preferred that the cross should have been left as it was before 1834, with the exception of such repair as was necessary to keep it from further dilapidation. It is not a building for use, but a monument, and the original stones, however worn, are of more value than any modern attempts to "preserve the design" could be.

UNDER the title of "Gardens, Grave and Gay" the Fine Art Society exhibits another collection of Mr. Elgood's pleasant and interesting garden pictures. Among them one or two drawings of Levens show the clipped tree fashion *in excelsis*, and the effect is as ugly as it is curious, a lesson to avoid extremes. Some of the slighter studies, such as "Cactus and Spurge" (44) are among the best in the collection. "A Quiet Hour" (18), a corner of a garden, with a seat under an angle of massive clipped hedge, with a bit of distant landscape, shows the true value of the reposeful expression of this style of treatment of a garden, when not carried too far. A drawing of the clipped alley at Melbourne (28) exhibits one of the dangers of formal gardening, as the masses are not straight or vertical, but tumbling about. This sort of formal work must be kept absolutely formal, or it loses its special effect and charm. The Fountain at the Palazzo Doria (65) is a very good bit of architectural work. The catalogue is prefaced by a short and pleasantly written essay on gardens by Mr. Reginald Blomfield.

WE hereby offer our best thanks to the large number of our contemporaries who have expressed themselves in such cordial and congratulatory terms on the occasion of our recent fiftieth anniversary of publication.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE sixth general meeting of this Institute for the present session was held on Monday evening last, the President, Mr. J. Macvicar Anderson, in the chair.

Portrait of Mr. A. Waterhouse, R.A., Past-President.

The President said that on their programme for the evening the presentation of the portrait of their past-President, Mr. Alfred Waterhouse, R.A., had been put down last. As, however, he thought that would be scarcely courteous, he proposed to take that business first.

Professor Aitchison, A.R.A., then rose to make the presentation. He said that by the amiability of his colleagues he had been elected chairman of the committee which had had the matter in hand. He said it was needless for him to dilate upon Mr. Waterhouse's great merits as an architect, and upon the distinguished position which he occupied in the regards of the architects of this country and of foreign countries. He was glad to say that the subscriptions received towards the portrait fund were sufficient to pay for the portrait. Mr. Orchardson, R.A., who had kindly consented to paint the portrait, had met the committee in a very handsome way, saying that it would not only be an honour to paint the portrait of a distinguished colleague and architect, but a pleasure. He thought that when they saw it they would say that the portrait was very successful, and that Mr. Orchardson had fully sustained his great reputation. It was satisfactory to know that the Institute now possessed portraits, either on canvas or in marble, of all its past-Presidents except one,—the late Mr. Edward I'Anson, whose lamented and unexpected death had left them without any opportunity of obtaining his portrait. On behalf of the subscribers he had very great pleasure in presenting the portrait to the Institute. (The portrait, which had up to this point been covered with red baize curtains, was then unveiled, amidst the applause of the meeting.)

The President said that on behalf of the Institute, he gratefully accepted the portrait, which he regarded as an admirable presentment of their distinguished and honoured ex-President, Mr. Waterhouse. Their warm thanks were due to Mr. Orchardson for the generous manner in which he had met the portrait committee, and to Professor Aitchison for the great trouble he had taken in organising the purely business part of the transaction. He felicitated the Institute upon the acquisition of so admirable a portrait for their collection.

The President then delivered the following address to students:—

On Some Responsibilities of the Architect.

Gentlemen,—Life is full of responsibility. If this be true of human life in general, it is emphatically so of the department which most concerns us—architectural life. Before entering on an undertaking the wise man counts the cost, and so it behoves you, who are about to enter on the career of the architect, to realise at the outset the responsibilities that will beset your path. Forewarned is forearmed. It is from no desire to deter you that I now crave your attention, for I hold that—provided you possess the necessary natural qualifications—the pursuit of architecture is one of the most delightful, as well as useful, avocations in which you can engage; but I have thought that to you, whose experience is as yet for the most part theoretical, it might not be unprofitable to learn something of the responsibilities you will be called on to discharge, from one who has had many years practical acquaintance with them.

Training and Study.—The primary responsibility, however, which meets you is one which you are yourselves competent to judge of without much assistance or guidance from others. The preliminary to all life-work is training. What is essential in other professions is equally so in architecture. There are those who tell you that artistic instinct is *the* essential qualification, and that if you have that, technical training is comparatively of little consequence. Without for one moment discounting the paramount importance of artistic endowment, to which I may refer later on, let me warn you against being misled by a doctrine so delusive. True, there have been, and no doubt will be, exceptionally gifted individuals who seem to grasp knowledge by intuition and to leap in a single bound over the laborious methods that have to be pursued by ordinary beings. But to rear on the basis of such rare exceptions arguments applicable to members of a large profession, is as absurd as it is misleading, and at the threshold of your career you may be absolutely certain that there is no royal road to the acquisition of knowledge, and that the only stable foundation on which to build the superstructure of a successful life's work is laborious and enthusiastic study. Hence it devolves on you, as students of architecture, to prepare yourselves for fitly discharging the responsibilities of life by availing yourselves now of such educational advantages as lie within your reach. Until recent years such advantages were hard to find, and it was mainly—if not solely—by picking up casually such knowledge as could be acquired during apprenticeship in the office of a practising architect that the student could educate himself. Now the case is different, and it is, I apprehend, in some measure attributable to the freedom of intercourse with foreign nations inaugurated during this century that such progress as we see has been attained. In France and Germany, as you are no doubt aware, the architectural student has to pass through a regular course of theoretical teaching in the school or the university. The same system is being adopted in America. The curriculum of the Architectural Association, as well as those of University College and King's College, indicate a distinct tendency to adopt—at all events in a modified degree—a similar procedure here—departures which thoroughly deserve all the support and encouragement we can extend to them. I do not desire that the practical training which can only be acquired by contact with actual work in an architect's office should be forestalled, but it is greatly to be desired that such training should be accompanied by theoretical and technical teaching such as is to be found in the courses to which I have referred. In the world's labour one day in seven is reserved for rest. In the routine of apprenticeship* it would be well were one day in seven also set apart for study outside of and apart from office work, and that the office hours were for pupils so arranged as to render it practicable for them to take full advantage of evening classes in the studio and the lecture-room, without unduly taxing or injuriously affecting brain-power. That a generous spirit now pervades the profession, exhibited in the desire to promote the education of students, is unquestionable. The establishment of teaching centres, not only in the Metropolis but in the provinces, demonstrates this.

I have already indicated that the development of this spirit may be to some extent traced to international intercourse, but I cannot doubt that it is more directly attributable to the action taken in recent years by the Royal Institute of British Architects, as the chartered representative of the profession in inaugurating and establishing a system of Examinations; for it is a fact, whether expressly stated or not that the curriculum of each teaching body is so framed as to meet the requirements of such Examinations. Now if the Examinations of the Institute had done nothing else, it must surely be admitted by all, be they advocates or opponents of the system, that to have in a few years produced such a result is a distinct gain to the profession, the possibilities of which in the future it is difficult to forecast or to limit. As by the enlightened policy of provincial societies educational facilities are provided, preparatory to local

* In the forms of Articles published by the Institute it is stipulated "that with the object of enabling the pupil to qualify himself for passing the Examinations for Studentship and Associateship," the Principal "shall and will allow the pupil such absence as he, the Principal, shall deem reasonable for the purpose of attending Lectures, Classes of Instruction, and the said Examinations."

Examinations in connexion with the Royal Institute, the whole country will be gradually embraced in an educational network the meshes of which will be occupied by the embryo architects of the future, who will thus enjoy educational advantages which were not at the disposal of we older men in our early days. Hence it seems to me that the Royal Institute, in awakening in recent years to the responsibility of providing education by creating an examining body and thus stimulating the organisation of teaching bodies, has conferred lasting benefits on the profession.

Having so far discharged our duty, we may fairly call on junior members and on students to fulfil the responsibility thus devolved on you by embracing the educational privileges which are now brought within your reach. Do not imagine that you will thus weaken the artistic instinct with which you may be endowed. The result of diligent study preparatory to examination is not in any sense to cramp or retard artistic development, but to equip you with knowledge which it is difficult otherwise to obtain, and without which no one would now be worthy of the name of architect. Let me, then, press on you the primary responsibility of qualifying yourselves for your life-work by entering on the educational courses and preparing for the educational test, which have been established with a view to your welfare. Quite recently I received a request from one who a few years since was a pupil of my own, and who is now practising in South Africa, that in order to promote his professional status I would propose him as an Associate of the Institute, accompanied by the incidental intimation that he was—I suppose by way of further fortifying his position — about to be married. I had to inform him that the only way to become an Associate was to prepare himself by study for the Examination, and I suggested that he might usefully turn to advantage the interesting position he occupied by spending his honeymoon in a visit to the old country for the purpose of passing the Examination. I have been tempted to mention the incident because of the sequel, for he has responded by asking me to send him a list of the books he should study and the particulars of the Examination. The spirit thus evinced in a resident of a far-distant colony is creditable, and I venture to commend it to your favourable consideration, at whose door the educational privileges lie, which he can only embrace subject to serious difficulty and sacrifice.

Commencing Practice.—Let us now pass from the responsibilities of the student to those of the architect, and assume that you have, after years of study and preparation, attained the goal of having your first commission confided to your care. I have still a vivid recollection of the emotions which this event creates; the sense of pleasure derived from the reflection that at last one is freed from restraint; the enthusiasm with which one anticipates the fulfilment of long-cherished hopes; the delight with which the youthful mind revels in the feeling that now has come the opportunity of teaching the world something worth learning! All such emotions are natural, and incidental to the freshness of youth, and the first sense of emancipation from thraldom, and, although subsequently sobered by experience, constitute a bright era of hope and expectation that in after life one recalls with pleasure and would not obliterate. I shrink, therefore from uttering anything that might detract from the hopeful anticipation with which you rightly regard this event. Only one word would I venture to interpolate. It is natural that in the first blush of actual experience the feelings I have depicted should predominate, and that you should indulge with unstinted satisfaction the prospect of crystallising your long-cherished fancies. But remember that this is not all. The indulgence of your fancy must be duly leavened by consideration for the fancy and wishes of him who has given you the opportunity you so welcome. I know by experience that in early years the tendency is—I admit not unnaturally—to consign this consideration to a subordinate place, or not to regard it at all. Do not forget, mid the exuberant joy of youthful freedom, or the justifiable pride of a first success, that your responsibility is to your client, and that you are bound, while indulging your idiosyncrasies, to do so in giving artistic and practical effect to his requirements and in promoting his interests. Should you ever entertain doubt in respect to the soundness of your advice, a good test will be to ask yourselves whether, were you occupying the position of your client, you would yourselves act in conformity with the advice you are giving him.

Architectural Design.—You will now have entered on the part of an architect's experience in which unquestionably is to be found the most absorbing interest and the keenest pleasure—the creation of design. This is the most elevating sphere in which you can work, because it opens the field for the exercise of your inventive faculties. Call it instinct—call it genius—call it what you may—here is educed and exhibited what makes the architect, and without which he is not an architect at all, the spirit of the artist. Cherish this native inspiration. You cannot create it by human agency. You cannot destroy it. But you can misapply it, or you can by discipline and control make it the medium of conferring lasting benefit on your day and generation. Responsibility attaches to every faculty, every talent we possess, and for the cultivation and use of this inspiration—the indispensable, as it is the noblest, qualification of the architect—you are responsible to Him who endowed you with it. Let this ennobling consideration inspire your work! When I refer to artistic design, I desire not to be misunderstood. To apply it to the design of the elevation only is unjustifiably to restrict its sphere, for the plan offers the primary, and perhaps the most important, field for the display of artistic skill. I must not dwell on this, having on a previous occasion specially treated the subject of the Art of Planning, but I venture to express the hope that I then succeeded in demonstrating the conviction I strongly entertain, that no part of an architect's work, from an artistic point of view, is more important than the study of the plan. I have referred to the responsibility of regarding your client's wishes and studying his requirements. Let me here say that to do so is not only a duty, but it is often the means of imparting to work its highest interest. To embody in design one's own fancies is comparatively easy: to combine one's personal proclivities with the requirements of a client is frequently most difficult. Difficulty creates interest, and to succeed in spite of it is always enjoyable, and imparts to any work a zest which it would not otherwise possess.

Working Drawings. — The general design approved, you will have to proceed with the preparation of working and detail drawings, in which you will find the continued opportunity for the exercise of creative power. Every part of a building drawn to a large scale, and every detail drawn full size, form subjects of constant and engrossing study, a true idea of which can only be acquired by experience. Apart, however, from the interest of design embodied in such drawings, it must never be forgotten that they are in their character and object totally different from preliminary sketches. The latter are prepared for the purpose of illustrating the design, and when once it has been embodied in the working drawings they may be said to have served their purpose. Working drawings, on the other hand, are records on the basis of which the interests of others depend. From them the quantities are measured. Upon them the contract is framed. Hence it is obvious that you will be responsible for making such drawings clear, precise, definite, practical. Anything like sketchy indecision admitting the possibility of a twofold interpretation—any contradiction between one part and another, or one drawing and another—anything in the nature of slovenly draughtsmanship—these and such-like careless defects are unpardonable. Working drawings are not worthy of the name unless they are drawn with decision and accuracy, consistent with one another, finished in ink, coloured, and reproduced in duplicate. You may naturally think that this goes without saying, but experience proves the reverse. It is because I have not infrequently seen working and detail drawings, prepared by so-called architects, which I have regarded as discreditable and unworthy, that I venture to urge upon you what I consider will be your responsibility in this respect. It is simple injustice to those whose interests are affected by them that working drawings should be other than unmistakably clear and definite. This does not necessarily imply that they must be devoid of artistic feeling. I have seen many, admirable in respect of their succinctness, and charming in respect of artistic draughtsmanship. Let me say that where practicable it is most desirable that detail drawings should be prepared prior to the quantities being completed, in order that there may be no room for misconception as to the amount of work intended and the labour on it. I am well aware—only too well—that the rush with which much modern work has to be prepared—greatly to be deprecated—often renders this impossible; but whenever it can be done it should be done, for the advantages to all concerned are obvious.

The Specification.—Following on the completion of the working drawings, your next responsibility will be the preparation of the Specification, the proper execution of which is of the greatest importance. Allow me to press upon you, from experience, the enormous advantage of writing your own specifications. No one can so clearly describe what he wants as the architect himself, and there is no valid apology for a young man failing to discharge this essential part of his duty. I always did so, until the pressure of work rendered it impossible to continue the practice. The work, I admit, is dry and uninteresting as compared with design and drawing, but it has an interest of its own, as all work has when honestly engaged in. Besides, it is no excuse or apology for the neglect of a part of our work, that it may not be so engrossing as other parts. That which is not unpalatable is frequently most beneficial, and a well-disciplined mind will take the bitter with the sweet and strive to do all alike well. To write your own specifications is to be familiar with every detail in a sense in which you cannot otherwise be. On your visits of inspection during the progress of the work, you will find yourself master of the situation with every detail at your finger ends in place of being dependent on others or constantly requiring to be refreshed by reference to a document with which you are only partially familiar. A specification, to be of use, must be full and clear, describing in terse language every branch of work, and leaving no room for doubt in the interpretation of its clauses. It should also have ample marginal notes for facility of reference. Much time will thus be saved. To write a specification is not artistic, but it is instructive work, and involves much consideration in respect to the nature of materials and alternative methods of construction. No one can properly write a specification who does not possess some practical knowledge of the building trades, and the materials employed in each. Hence to leave the preparation of the specification in other hands when you can do it yourself, is deliberately to abandon the means of keeping yourselves in touch with much of the scientific progress of the day in its relation to architecture. Never, therefore, be induced to relinquish the personal discharge of this responsibility, so long as it is by any means possible to accomplish it.

The "Quantities."—With the completion of the drawings and specification other personages come upon the scene, in relation to whom your responsibilities will be extended. The appointment of the quantity surveyor will generally rest with you, and you will find it of the utmost importance to secure the services of one who, having acquired a thorough practical training, is conversant with the details of each trade, and who is quick and accurate. These qualities, combined with experience, will alone inspire the necessary confidence. The customary practice of including the charges of the quantity surveyor in the builder's contract and account does not commend itself to my judgment. For many obvious reasons, it would be better that they should be charged direct to the client and paid direct by him, subject to the approval of the architect. Need I add that the charges of the quantity surveyor, whether made direct or embraced in the contract, should, in every instance and without exception, be entirely independent of the charges of the architect. For the architect to participate, in any form whatever, in charges made by another, instead of being made direct to his client, would be alike unjustifiable and dishonourable. The practice with some architects is to take out their own quantities—a practice which very generally prevails in the provinces, though comparatively rare, I believe, in London. That such a custom is remunerative goes without saying, and it is justified on the ground that the necessary dissection of the building in the bills of quantities makes the architect more familiar with every detail than he would otherwise be. For my own part, while there is, of course, nothing dishonouring in the practice to those who care to engage in it, I consider that it is not in the least degree necessary on the ground stated, and that, in the case of one aiming at a purely architectural practice, it is not desirable. If an architect is not sufficiently conversant with every detail after having designed the building and prepared the working drawings and specification, he must be obtuse indeed. You will find quite enough to engross your time and thoughts in what—to my mind at least—is the more legitimate domain of architecture.

The Contractor.—To the contractor who engages to carry out your designs in accordance with your working drawings and specification, you will stand in a relation of undoubted responsibility. You will be the medium by whom arrangements between your client, on the one hand, and the contractor on the other hand, will be made. You

will thus occupy the position of an agent, and cannot be relieved of its responsibilities. You will have to see that the contract is fairly and honourably carried out by both parties to it—protecting your client, on the one hand, from any attempt at evasion by the use of faulty materials or defective workmanship, and protecting the contractor, on the other hand, from any tendency to deprive him of legitimate remuneration for work properly executed. This dual responsibility you will only be competent to discharge by possessing such practical knowledge of materials and workmanship as will enable you to judge what is good and what is defective, and by uniformly maintaining an attitude of independence and integrity. I have met with clients who have not hesitated to condemn contractors as a class whose habits are predatory and who live on robbery, forgetting that there have been those in their own position to whom such strictures, if fair in the one case, would be equally so in the other. That such sweeping condemnation is unjust I need scarcely say, and your responsibility will sometimes consist in protecting the honourable client and the honest contractor from its injurious effects. My experience of life has been that one class is morally no worse and no better than another. Human nature is much the same, regardless of external circumstances. Morality is an individual, not a class, distinction. It has been my fortune, and I trust it may be yours, to meet with but few clients and few contractors whom I could regard with feelings other than those of respect and confidence. The large majority have been men whose gentlemanly courtesy, on the one hand, and whose admirable work, on the other hand, have reflected credit on themselves, and inspired confidence in others.

Conduct of Works.—In superintending the execution of your designs you will find ceaseless pleasure, for there is a singular fascination in watching the gradual development of your ideas and their translation into a material and durable form. You will, if you care for your work, experience regret—as I have often done—that you are unable to live on the work, as the monks of old did, personally judging of each feature and detail in the position it is to occupy. Seeing that this is impossible in modern practice, it will be necessary for you to have a resident representative or clerk of works. In the selection of this official the greatest care and circumspection should be exercised. Practical experience, moral integrity, and tact are indispensable qualifications. Once find a man on whose honour you can rely, and whose efficiency has been demonstrated, part not with him if you can help it; he is invaluable, and worthy of being regarded as a friend indeed. But your responsibility will in no way be diminished by reason of your having such a local representative, for without periodical visits of inspection it would be impossible that you could attest that the work had been properly executed, or that you could append your signature to documents certifying that the contractor is entitled to payment. To sign a certificate should never be regarded as a matter of form; it is, on the contrary, a serious responsibility which your client will rightly expect you to discharge with fidelity. It is satisfactory to all concerned when the final certificate represents no more than the balance of the contract, and you should regard it as a responsibility to do all in your power to attain this result. In the case of a new building you will experience no difficulty, provided changes are not made in the contract drawings; but in the alteration of an old building there is more room for uncertainty, and therefore the more reason for circumspection and foresight. Architects are often censured for incurring increased cost, when it is really attributable to changeableness on the part of clients who will not be controlled, and who, although willing enough to embark in variations, do not always display corresponding alacrity in paying for them. Hence you will find it well not too readily to sanction variations which will involve additional cost, and not to encourage erratic clients to entertain them. An architect should strive to achieve a reputation not only for designing good buildings, but for completing work entrusted to his care without any increase on the amount of the contract. In superintending work, knowledge of materials and workmanship is essential, but knowledge of men, and tact in exercising it, are also invaluable qualities. Firmness combined with tact and courtesy will educe willing and cheerful compliance with your instructions, where mere bullying—too frequently resorted to—will only lead to opposition and induce contempt.

Responsibilities of neighbours.—Besides those I have mentioned, there are others to whom, in practice, you will occupy a position of responsibility. I cannot refer to all. Take one as an illustration. Most of you will in due course be called on to build in London, and you will in that event have to deal with the complicated Acts of Parliament controlling Metropolitan building and specifying the relative obligations and privileges of building and adjoining owners, for one or other of whom you will have to act. To rightly interpret Acts of Parliament is not always easy, and if I may venture to say anything so heterodox, I fancy difficulty is occasionally experienced even by those whose official duty it is to enforce them; but there are, I think, certain general principles which should always inspire our responsibility. Building and adjoining owners, whoever and whatever they may be, have one common characteristic — they are neighbours. Many centuries since the question was asked, "Who is my neighbour?" It would be well were the spirit which inspired the reply more frequently found to pervade the negotiations between those neighbours with whose responsibilities architects are sometimes concerned. Too often is the building, or the adjoining owner, as the case may be, regarded as one whom it is well to pass by unheeded, one whose interests are opposed to our own, one who if he has the chance will take advantage of us, and one, therefore, of whom we are perfectly justified in taking advantage. I do not draw a picture that experience does not justify. Who has not heard of work having been pushed forward to completion with undue haste, or in the dull season, in the hope that, once done, it will remain, whether it inflicts injury to a neighbour or not? To designate such procedure as sharp practice is to use too mild a term; it is dishonest, dishonourable, and worthy of all reprobation. Apart, however, from its immorality, it is stupid. Honesty not only commands the approval of conscience, but in such matters, it is the best policy. You are much more likely to get what you want from a neighbour by approaching him in a straightforward spirit, treating him with frank confidence, and asking his permission to deal with joint property in the manner you wish, than by unworthily trying, directly or indirectly, to take advantage of him. Do as you would be done by, is the motto of the Christian and the gentleman, which I recommend for your invariable adoption when discharging your responsibilities in connection with the interests of those who are neighbours.

Practice and Art.—Now it may have occurred to you that in regard to some of the responsibilities of the architect to which I have referred, it is difficult to trace any direct connection with Art. The drafting of a specification, the arrangement of the conditions of a contract, the adjustment of differences between your client and the contractor, the treatment of the rights of your client in respect to his neighbour; or, again, the provision and arrangement of sanitary appliances, or the endless correspondence on mere matters of business which occupies so much time—these and other matters of a similar nature cannot by any stretch of imagination or any exercise of ingenuity be brought within the category of artistic work. Yet these are unquestionably responsibilities the discharge of which properly falls on the architect, and the neglect of which involves the necessary sequence that he fails in his duty to his client. Is it, then, true that the avocation of the architect is a purely artistic one, aad that such matters as those which I have just specified should be relegated to the surveyor or the engineer? If so, then much of what I have said to you of your responsibilities is false teaching. But I appeal to common sense—I appeal to universal experience—nay more, I appeal to the practice of architects who are undoubted artists, to demonstrate that the assumption is unfounded. I have, I hope, said enough to satisfy you that I consider your noblest and highest responsibilities will be found in the development of your artistic faculties in design. This is indisputable. To design in truth, purity, and with artistic feeling, is unquestionably the most elevating attainment to which you can aspire, success in which will constitute the keenest pleasure you can hope to experience in your professional career. This is the most important part in the architect's work, but to assert that it is all is deliberately to close the eyes to patent facts in the vain effort to establish as truth a purely visionary theory.

Gentlemen, in this necessarily brief survey I have touched on some only of the responsibilities which you will be called on to discharge in the practice of your profession. Others will occur to you on which I might have dwelt had time permitted. One, however, remains, reference to which I dare not omit—your responsibility to yourselves. In this, after all, is to be found the key of the whole position. Be true to yourselves, and you cannot but be true to others in every relation of life. Truth must and will prevail. Enthroned in the heart, it will find outward expression through the intellect in design, and through the courtesies of life in practice. If true to yourselves in the earnest preparation for your career by diligent study and laborious research—if true to yourselves in the firm resolve to develop to the utmost those faculties with which you may be naturally endowed—if true to yourselves in the lofty ambition to consecrate your powers to the promotion of art and the benefit of the community, you will not only be true to all others, but you may cherish the well-grounded hope that you will attain success. And in all your struggles and efforts to discharge with fidelity the responsibilities of your calling, remember this—that you will not be less likely to inspire confidence and attain success as architects if you constantly bear about with you, in the complicated relationships of your professional life, the unmistakable characteristics of gentlemen.

Mr. William Emerson, Hon. Sec., then read an interesting review and criticism of the students' drawings. Inasmuch, however, as these remarks extended to considerable length, and could not, with justice to them, be abridged, we are unable to find room for them, owing to the great demands upon our space. It is, indeed, unnecessary that we should print them, seeing that the gentlemen most concerned, the student-competitors themselves, will be able to read Mr. Emerson's remarks in the *R.I.B.A. Journal*. Our own criticism of the drawings submitted will be found in last week's number of the *Builder* (see p. 24, *ante*).

On the motion of Mr. John Slater, a vote of thanks was accorded by acclamation to the President and the Honorary Secretary for their addresses.

The President then proceeded to distribute the prizes to the successful competitors, whose names we published last week (see p. 29, *ante*). Mr. Anderson very happily contrived to address a few appropriate and well-timed words of congratulation or encouragement to each recipient.

The meeting then terminated. The next meeting will be held on Monday, the 30th inst., when Mr. Arthur Cawston, Associate, will read a paper "On the Advisability of Undertaking the Improvement of London Streets on a Comprehensive Plan."

BYZANTINE ART IN ITALY:

THE ARCHITECTURAL ASSOCIATION.

THE sixth meeting of this Association for the present session was held on Friday, the 14th inst., at 9, Conduit-street, the President, Mr. H. O. Cresswell, in the chair.

Mr. W. Petch was elected a member of the Association, and five gentlemen were nominated for membership.

Mr. E. S. Gale, Honorary Secretary, having announced several donations to the library, a vote of thanks was accorded to the donors.

Mr. R. Phené Spiers, F.S.A., then read the following interesting paper

On the Influence of Byzantine Art in Italy, from the Fifth to the Twelfth Century.

The archæological researches of the last fifty years, and the valuable records which have been left to us in the works of Rickman, Professor Willis, Parker, Sharpe, Scott, Street, and Burges among our own countrymen, and Viollet le Duc and de Caumont in France, have so far raised the veil of obscurity which hung over that period known as the "dark ages" as to have eliminated from its shadow the second half of the eleventh and the three following centuries. Attempts were made by Hope, Dr. Whewell, and Professor Willis to carry back the date, but till within the last few years the entire absence of documentary evidence, the want of a systematic study of the fragmentary remains left to us, and a general inclination to ascribe to buildings a greater antiquity than the civilization of the precise epoch would admit of, has created some confusion, and failed to penetrate the mystery of the period I have selected for my paper. The subject, however, is so vast that I have found it necessary to confine my remarks to a portion of one country only, viz., the North of Italy, and to the influence of one particular style only, the Byzantine, in the development of its art.

The two books to which I am the most indebted for my information are, de Dartein's "Étude de l'Architecture Lombard," completed in

1882, and Cattaneo's work, published 1890, which bears the same title as my paper, except that I have taken another century in order to include St. Mark's and a large series of buildings, which illustrate the extensive influence of the Byzantine style in Italy during the twelfth century.

With de Dartein's work I had long been familiar, and failing other evidence had acquiesced to a certain extent in the dates given to the various churches illustrated in it. When, however, in the beginning of 1892, I came across Cattaneo's work, and found so wide a difference of opinion, a new interest was awakened, which increased as I followed the arguments brought forward. It was necessary for me to master the facts in order to revise the new edition of Fergusson's "History of Architecture," on which I was then engaged, and it occurred to me that it might be of some interest to the members of this Association, and induce those of you who in future years have the opportunity of travelling in Italy, to carry further the inquiry. I felt, however, that my statements would come with more authority if I were able to visit some of the monuments in question, so as to be able to differentiate the dissentient opinions expressed by the two authors above named, and also to make drawings, or procure photographs of some of the more important details, which would enable you better to judge for yourselves. I could not hope to get as far as Rome, but in the months of August and September last I visited Como, Milan, Brescia, Verona, Vicenza, Padua, Venice, Ferrara, Ravenna, Ancona, Bologna, Parma, Piacenza, and Pavia, and studied most of the buildings with which the immediate subject of my paper is connected. The Byzantine influence in Pisa and Lucca, and in the South of Italy—at Troja, Bari, Bittonito, Altramura, &c.,—is of an entirely different type, and was inspired by the work of the later Great Empire. It the North of Italy it radiated from Ravenna, and is of much earlier date.

To place my subject clearly before you, I must commence by pointing out the essential characteristics of Byzantine buildings—1st, as regards plan; 2nd, construction; and 3rd, decoration. I shall only be able to touch on the salient points, otherwise my paper would be one on the Byzantine style, which has already been treated by Professor Aitchison at the Royal Academy. When Constantine transferred the seat of empire from Rome to Byzantium, he rebuilt the ancient town, doubling its size; he surrounded it with walls, and divided it into fourteen Regions or quarters. The buildings which he erected consisted of churches, palaces, thermæ, forums, &c., all of which would seem, from the descriptions given, to have been based on those of the Eternal City, with one important difference: they were so hurriedly built, and in materials of so ephemeral a nature, that none of them have been preserved to our day; in fact, many were pulled down and rebuilt by Justinian two centuries later. Two constructions of his time remain—the Bin-Bir Derech, or cistern of the thousand and one columns,* and the Yeribatan Serai—two large underground reservoirs for storing water. There is one great basilica, built by Constantine, still existing in Syria, viz., the Church of the Nativity at Bethlehem. This church, and those which are described by Eusebius as having been erected in front of the Holy Sepulchre at Jerusalem, and in other places, show us that the type of plan adopted was not dissimilar to those which Constantine built in Rome, viz., the ancient Church of St. Peter, pulled down in 1506, the Church of St. John Lateran, which still exists, and others which have been rebuilt since. In all these Roman examples, materials from ancient buildings were used up,—temples, tombs, and other erections being despoiled to provide columns, capitals, architraves, &c., for them. The church at Bethlehem is a simple basilica, with nave and aisles, the columns and capitals being clumsier and more debased than any examples could be in Rome. From Eusebius's description, the basilica at Jerusalem had triforium galleries set apart for women, according to the requirements of the Greek Church; and these galleries exist in two basilicas of later date at Thessalonica, the Eski Djuma and the Church of St. Demetrius. Both of these churches had timber roofs. From these we pass to the Mosque of St. Sophia at Constantinople, commenced by Justinian in 532, in which the chief feature is an immense central dome with eastern and western semicircular apses, and with aisles and triforium galleries, all vaulted, surrounding the central space. This church must be looked upon as the apotheosis of the Byzantine style, and no dome of similar size was ever again attempted in the East; but it gave the key to a new plan, which is usually called the Greek cross, in which there is a dome in the centre and barrel vaults over the nave, transept, and choir. In later times this dome was raised on a drum in which vertical windows were pierced, and sometimes other domes of slightly less importance over nave, transepts, and choir, or over the four angles included by them. In the Church of the Holy Apostles the four other domes were over the nave, transepts, and choir; in the Church of the Assumption at Moscow, on the angles. A second type of plan is found in the round churches, but these do not differ from much earlier examples in Italy; the most important variation, however, is found in the Church of St. Sergius at Constantinople, also built by Justinian, a church with an octagonal central space covered by a dome, seven semicircular niches, and a choir, with aisles and triforium galleries all round. Towards the end of the sixth century, in addition to the central apse in Greek churches, two others were added to contain altars for ceremonial purposes. As they were always hidden by the Iconostasis, they served a different purpose from that in the Roman Church. It is, perhaps, more a question of construction than of plan, but I may here note that whilst internally in Byzantine work the apse is circular, externally it is almost always polygonal.* In Western Europe it is always circular unless influenced by Byzantine work.

I come now to the second section, that of Byzantine construction. Besides the architects and workmen whom Constantine took with him to Byzantium, he is said to have exported other treasures, and not only bronzes and marble statues, but even columns and capitals. It was evident, however, that these would, in course of time, come to an end, so that he was probably soon obliged to have recourse to whatever materials were at hand. Of timber he had plenty, but there was no stone except of small dimensions, unless it were imported from distant quarries. The means at his disposal were apparently not sufficient to enable him to undertake those stupendous works in concrete, one of which—the Temple of Peace in the Forum—he had completed in Rome, and which still exists in part after fifteen and a-half centuries. He was obliged, therefore, to do the best he could with rubble masonry or with brick, the materials for making which were abundant in the vicinity of the new city. De Dartein points out in his work that brick, when employed as the chief material, exercises a considerable influence on architectural design, on account 1st, of the regularity of its form and, 2nd, of its restriction in construction. It offers great facilities for the employment of arch construction, and tends to replace the architrave or lintel. It restricts the projections of cornices, and, on account of its numerous joints, it suggests the employment of relieving arches supported on piers, leaving the walls to be filled in afterwards as partitions. What may have been the tentative efforts of Constantine and his immediate successors we know not; the buildings of Justinian's reign already mark the invention of a new style of construction; immense arches, measuring sometimes 5 ft. high, of brickwork in two or three rings, with huge piers and buttresses, are employed in the churches of St. Sophia at Constantinople and Thessalonica, the bricks measuring from 18 in. to 20 in. by 12 in., and 1½ in. to 2 in. thick, with joints of mortar of nearly the same thickness, and at the extrados of the arch still greater. Even in smaller openings, from 3 ft. to 6 ft. span, brick arches of 16 in. or 18 in. depth are used instead of two or three 4½ in. brick rims which we employ. (In the campanile of St. Apollinare in Classe, Ravenna, I noted a window 6 in. wide with voussoirs 14 in. deep. In this case special voussoirs had been made 1 in. thick at one end and 3 in. at the other, the mortar joints also differing in thickness in the same way).

In the construction of their vaults there is a much more important change from Roman work, and from the fact that the two great cisterns (already spoken of) in Constantinople were vaulted in the new manner, we may assume that they were built by Eastern workmen, who carried out the traditional method of building domical structures employed by the Assyrians. In these days and here in England, where Baltic timber is to be had in any quantity and at small cost, we do not hesitate to employ centering for every description of arch, centering which afterwards becomes waste timber. In early times, however, they built without centering, and M. de Choisy's book on "L'Art de bâtir chez les Byzantins" illustrates a large number of methods by which this could be done.

The vaulting surfaces were always domical, so that when complete each ring was self-supporting, and by building the rings on an inclined plane with the bricks flat-wise and not end-on, each ring was partially supported by the one beneath. This method allowed of a less thickness being given to the vault, and reduced considerably its thrust.

Geometrically speaking, whilst the surface of a Roman barrel vault is evolved by a semicircular ring travelling along horizontal line, in Byzantine vaulting the line rises and is curved. This is only the elementary form, but in its intersections it follow the same principle.

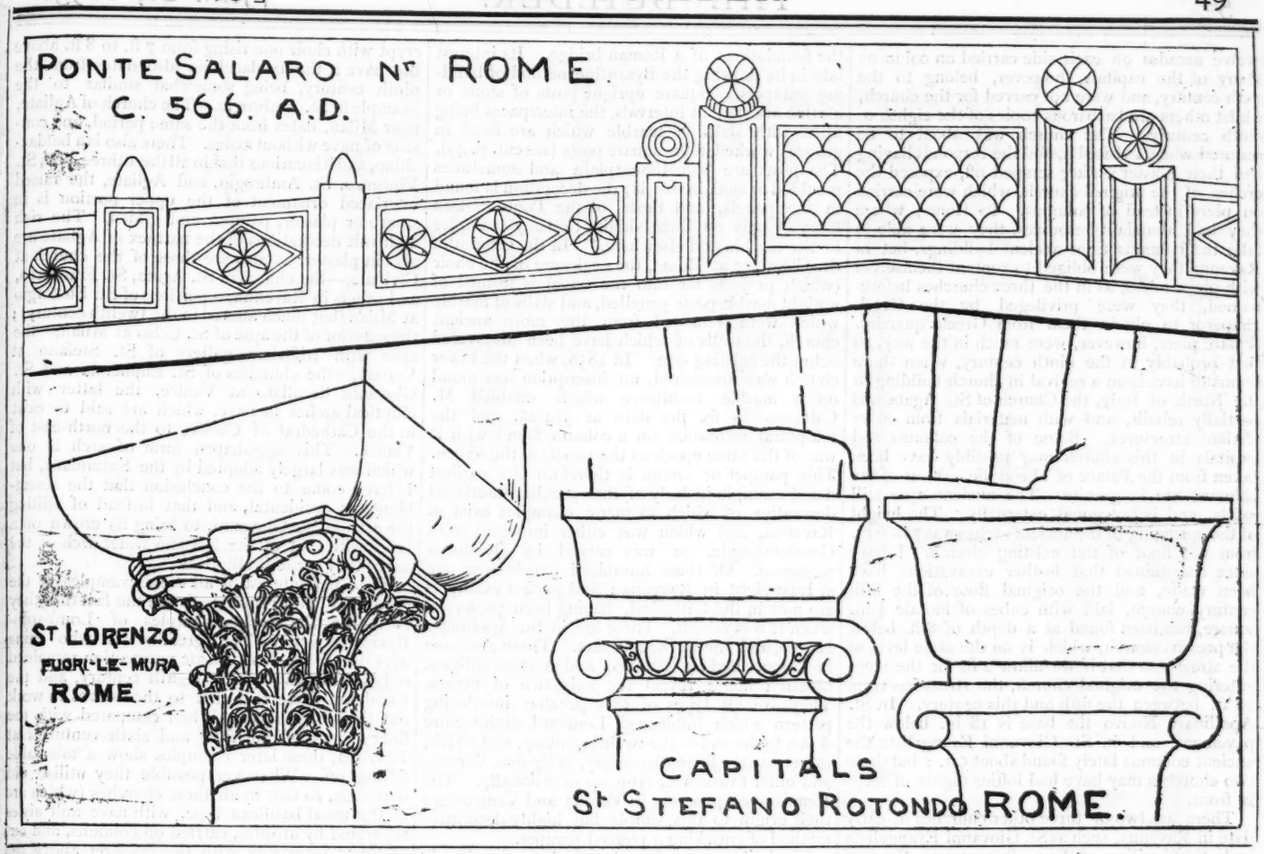
The Byzantine architects also would seem to have recognised at a very early period the fact that a pier or support of a homogeneous nature such as granite, marble, or stone could carry a greater weight than one built up of bricks; and further, that it might even be of less diameter than the wall carried, provided all lateral thrusts were counteracted. Now in all Roman work the face of the architrave (and in late work, as at Spalato) the face of the arch is in the same plane as that of face of column. In the Church of St. Paul, outside the wall of Rome, built 388—where arches are thrown from column to column, the thickness of the wall and the width of the base or die from which the arches spring is equal to the upper diameter of the column. In Byzantine work, however, both are much greater. Consequently, the Roman capital, with its ordinary abacus, was neither large enough or sufficiently strong to meet the new requirement. They inserted, therefore, a new feature called the dosseret, or impost-block, between the capital and the wall above. It has been thought this was a corruption of the old Roman architrave. If so, its earliest examples would recall the mouldings of same, but in the Eski Djouma, at Thessalonica, dating from the beginning of the fifth century, it appears as an absolutely new and original feature, designed solely to meet a constructional want, and without reference to precedent. It is not necessarily square, and sometimes two of the sides will project like a bracket. The dosseret, therefore, is one of the most characteristic features of the Byzantine style.

I come now to the third head, decoration.

Of external decoration, beyond that which is afforded by the courses of brickwork or by the brick voussoirs, in which variety is given occasionally by difference of tint, and in later work of the eleventh and twelfth century, when patterns of brick or inlaid tiles were employed, there is not much to be said. It was rather in the interior that the Byzantine artist lavished the resources of his art. In the decoration of the lower part of the walls with panellings of the richest marbles, and of the upper portion and of the vaults and soffits of arches with a vast surface of mosaic, the Byzantines carried on the traditions of Roman architecture, but the treatment was new and original. They restricted the carved decorations to those features which had special constructional functions to serve, such as the capitals and bases of the columns, the lintels and jambs of doorways and windows, or such as were required to emphasise certain lines in the buildings, as string-courses or cornices. In all these features they were specially reticent as regards their projection, so as not to clash or form too great a contrast with the large flat surfaces of marble or mosaic. Though many of their capitals were based on those of the Roman Corinthian, or Composite orders, we notice a tendency to change: 1st the contour of the capital, which inclines from the bell towards the form known as the cushion capital, and, 2nd, the leaves, instead of being so much in relief as to suggest that they were in their origin applied to the bell, on the contrary, seem rather to emerge from the solid block. These tendencies become the more apparent when, with a cubical block (the lower angles of which had been chipped off to merge into the circular annulet of the column), they proceeded to set out a scheme of surface decoration and cutting back from the surface, to evolve a new variety of design, partially geometrical and partially of leaf ornament. It is in this class of capital that we find the greatest originality, and in the play of light and shade considerable beauty. In these examples also they seem to have been very fond of undercutting. Piercing holes with a drill is found in the debased work of most styles, but the Byzantine artists turned its effects to more account, and frequently employed it in conjunction with carved foliage of good character. The influence of Byzantine design, however, is chiefly

* There are actually only 212 columns, and they are said to have been originally quarried for some great building in Rome.—R. P. S.

* The exceptions are the Pantokrator, Constantinople, St. George's, Thessalonica, and the churches in Central Syria.—R. P. S.



conspicuous in the decoration of the enclosures of choir-screens, parapets of balustrades, episcopal thrones, ambones or pulpits, and baldacchinos or ciboriums. To the results of such influence I will draw your attention later on.

Although the early history of the Byzantine style can be carried back two or three centuries before the foundation of Constantinople, its influence on Italy was not felt till the Empire had become well established; in fact, more than a century elapsed before we find it in the ancient baptistery, the tomb of Galla Placidia, and the Chapel of St. Chrysologus in the Archiepiscopal Palace, all in Ravenna. In these examples it is chiefly shown in the mosaics with which they were decorated, and which were probably executed by Byzantine workmen. The Baptistery at Ravenna is said to have been built by Archbishop Ursus in 380 A.D., but this refers, I think, to the main structure, which probably was originally covered with a wooden roof. When in 451 it was determined to decorate it with mosaics, the vault was probably built to receive them. There is no documentary evidence of this statement, but the internal structure suggests that a change from the original design has taken place. In order to bring the thrust of the cupola well within the walls, it would seem to have been lined with eight arcades of two stories, which project inwards about 16 in. and the pendentives are carried on corbels projecting 10 in. more. Now, whilst the exterior of the Baptistery shows no Byzantine influence in its brickwork and cornice, three of the capitals which carry the lower arcade inside are Byzantine, and all are surmounted with the Byzantine dosseret. The dosseret appears again on the Ionic capital of the upper arcades,, and the width and depth of the springing base of the arches are greater than the diameter of the column. The corbels carrying the main arches and the pendentives are sculptured with Byzantine foliage. Under each arch of the upper story are three arcades, the centre one pierced with large windows of modern date, the side arcades decorated with niches and figures in low relief, all executed in plaster. I noted these at the time as being peculiar, and subsequently in the museum at Bologna I came across some Byzantine ivory tablets of similar design.

Whilst the mosaics of the tomb of Galla Placidia and probably the dome on pendentives (the earliest example known) are Byzantine, the walls of the building were built by native workmen, and the bricks are much thicker and of less lateral dimensions than those in St. Vitale and other churches in Ravenna of the sixth century.

The next example in date is in Rome, where in the Church of St. Stefano Rotondo, in the outer ranges of arcades above the capitals we find the Byzantine dosseret and a similar feature is said to exist in St. Angeli at Perugia.

The dosseret is found also in that eastern portion of the Church of St. Lorenzo fuori-le-Mura at Rome, where, in fact, it might have escaped attention except that its capitals are fine Byzantine examples crisply carved, and they support the arches of a triforium gallery which I have referred to as an essentially Byzantine feature. Except in St. Lorenzo (where they were added by Pope Pelagius about A.D. 585), and in St. Agnes in A.D. 630, the dosseret is not found in any other basilica in Rome.

For the next important examples I must now return to Ravenna. Ravenna, I might here point out, was selected in preference to Rome as the capital by Honorius in 396 A.D., and from that time for some centuries it was occupied as such by the reigning sovereigns; hence the importance of its buildings. Theodoric, King of the Ostrogoths, who reigned from 493-525 A.D., would seem, architecturally speaking, to have been a very remarkable man, having erected more monuments than even the later Roman Emperors. As the Goths, however, had formed no style of their own, he employed such artists as were at his service, and in the additions he made to the Baths of Caracalla in Rome, and in the churches he restored there, he insisted on the ancient Roman style being carried out in its integrity. "We owe everything," he said, "to the Roman artists." For the new works, however, which he proposed to build in Ravenna, he imported artists from Constantinople with whose work he was well acquainted, having spent part of his life in the Byzantine capital. The palace which he built, and of which a fragment only remains, is an imitation of the golden gateway by Diocletian at Spalato, but in it we find, perhaps, the earliest instance of the large thin bricks or tiles which are so characteristic of Byzantine construction. Judging by the mosaics on the walls of St. Apollinare Nuovo, in which the palace is represented with columns of two dimensions, the general design was Roman. The principal work of his still exists in the great church of St. Apollinare Nuovo, a fine basilican church with twenty-four marble columns, said to have been brought from Constantinople, but more probably procured from one of the Greek quarries by permission of the Emperor. They carry capitals of debased Byzantine work, and have dosserets carved with crosses; the archivolt mouldings of the arches above them are debased Roman. The entablature which takes the place of the impost mouldings of the responds are so Roman in their execution that they might almost have been taken from some ancient edifice. They are decorated with console brackets alternating with bull's heads. The existing choir and apse are of later date, though the Byzantine influence is shown in the polygonal exterior of the latter.

We now pass on to the Church of St. Vitale, which was built by St. Ecclesius, Bishop of Ravenna, on his return from Constantinople, A.D. 535, the design of which was based on the Church of St. Sergius in that town. Except that, in accordance with native custom, the vaults of the triforium galleries and the central domes are covered with timber roofs (necessitated probably by the difference in climate, and this constitutes the main distinction between Eastern and European domes), the whole construction is so Byzantine that it must have been designed by Greek workmen. Owing to the timber roofs over the triforium galleries it was necessary to raise the hemispherial dome higher than in St. Sergius, so as not to interfere with the eight windows with which it is pierced. Whilst in St. Sergius the lower story of the eight semicircular recesses has columns carrying architraves, in St. Vitale the story is loftier, and there are arches. The capitals of the lower story are of the same peculiar basket type we shall find in St. Mark's, but they are not so fine in execution, which suggests that they were carved on the spot by second-rate Greek artists; whilst those of the latter were probably imported from the East. The capitals of the upper story and those of the choir are identical in their design with examples at Constantinople and in Thessalonica. The vault is constructed, for the sake of lightness, with earthern pots fitted one into the other. This system was adopted in St. Stefano Rotondo, in the outer aisles, which were vaulted, and in other earlier examples in Rome.

The great basilica of St. Apollinare in Classe, three miles from Ravenna, was being erected about the same time, A.D. 535-45. Its capitals are much more clumsy than those of St. Vitale, and although they are based on examples at Thessalonica, the design and execution are due to inferior Greek sculptors. The responds of the nave arches are decorated with ornament in plaster; though clumsy, they are vigorous in treatment, and may have suggested the design of the capitals of the court of the Town hall at Bologna of the fourteenth century. Here and in St. Apollinare Nuovo the soffits of the arches of the nave are decorated with coffers in plaster, which are, I think, of later date,—in fact, sixteenth century work. The archivolts in both churches are in stone, and close copies of Roman work, which suggests that they were worked by native carvers.

The Church of St. Agata is said to date from the fifth century. It is a basilican church, with

twelve arcades on each side carried on columns Many of the capitals, however, belong to the sixth century, and were not carved for the church, whilst others are barbarous copies of the eighth o ninth century. The church was about to be restored when I visited it, and the responds having had their plaster surface scraped off, exposed the arches of the original church, which were carried on piers instead of columns. In Rome, where they had abundant resources, they were able to take the columns from ancient buildings, but in Ravenna they were obliged to content themselves with piers unless, as in the three churches beforenamed, they were privileged by the Greek Emperor to obtain them from Greek quarries. Square piers, however, were much in the way, so that probably in the ninth century, when there seems to have been a revival in church building in the North of Italy, the Church of St. Agata was partially rebuilt, and with materials from more ancient structures. Some of the columns and capitals in this church may possibly have been taken from the Palace of Theodoric. Four of the columns are in granite. The ancient apse still exists, and is polygonal externally. The height of the springing of the ancient arches was 7 ft. 6 in. from the floor of the existing church. I have since ascertained that further excavations have been made, and the original floor of the fifth century church, laid with cubes of mosaic ½-in. square, has been found at a depth of 8 ft. below the present church, which is on the same level as the street; so that if we allow 2 ft. for the steps entering the original church, the street has risen 10 ft. between the fifth and this century. In St. Apollinare Nuovo the base is 18 in. below the pavement, and in St. Giovanni Evangelista the ancient columns lately found about 5 ft.; but these two churches may have had loftier flights of steps in front.

There are two or three other churches of early date in Ravenna, such as St. Giovanni Evangelista and other basilicas of the ninth century. Some of the columns of the earlier Church of S. Giovanni have lately been found embedded in the west wall, and they are of much greater size, and possess much finer capitals than those in the existing church. In all these examples of the fifth and sixth centuries the Byzantine influence is shown in the dimensions of the bricks used, which measure 18 in. to 20 in. long, by 12 in. to 13 in. wide, and about 1¾ in. thick, with mortar joints of the same thickness. And this gives a style and a character which are quite unmistakable. The apses also, when ancient, are all polygonal externally. Passing to other towns, the Church of St. Lorenzo at Milan, was rebuilt in the sixteenth century, but on the ancient plan. At present it is an octagonal church with four semi-circular apses, each with vaulted aisles round them and triforium galleries over. It was originally the Cathedral of Milan, and was mentioned in the eighth century as being remarkable for its beauty and magnificence. It is considered by de Dartein to have been originally a square building with hemispherical dome carried on pendentives. If so, it was probably based on St. Sophia at Constantinople; but, not venturing to throw a dome of such dimension, they increased its size internally by having four semi-circular apses instead of two. The diameter of these, however, was only about two-thirds of the width of the central space, in order to obtain propre abutment for the arches, and avoid the difficulty which had been experienced by Justinian in St. Sophia; in addition to this, they built a tower at each angle. In the beginning of the twelfth century the dome fell in, and it was replaced by an octagonal one, carried on arches thrown across the angles. It was rebuilt in 1575, and, according to the letters of the architect, on the old foundations, but this time additions were made to the angle piers, which have transformed it into an octagonal church, but as the sides at right angles to the diagonal lines are narrower than the others, there are still arch pendentives above to carry the dome, which is a regular octagon. The church is so enclosed that very little is visible of the external structure; the only tower I could see is built (about 20 ft. above the ground) with the Byzantine type of brick I have already referred to.

The Church of St. Fidele, at Como, of the twelfth century, seems to me to be based on St. Lorenzo, except that there is a regular nave instead of one of the apses. Triforium galleries also existed except round the eastern apse, where there is only a passage.

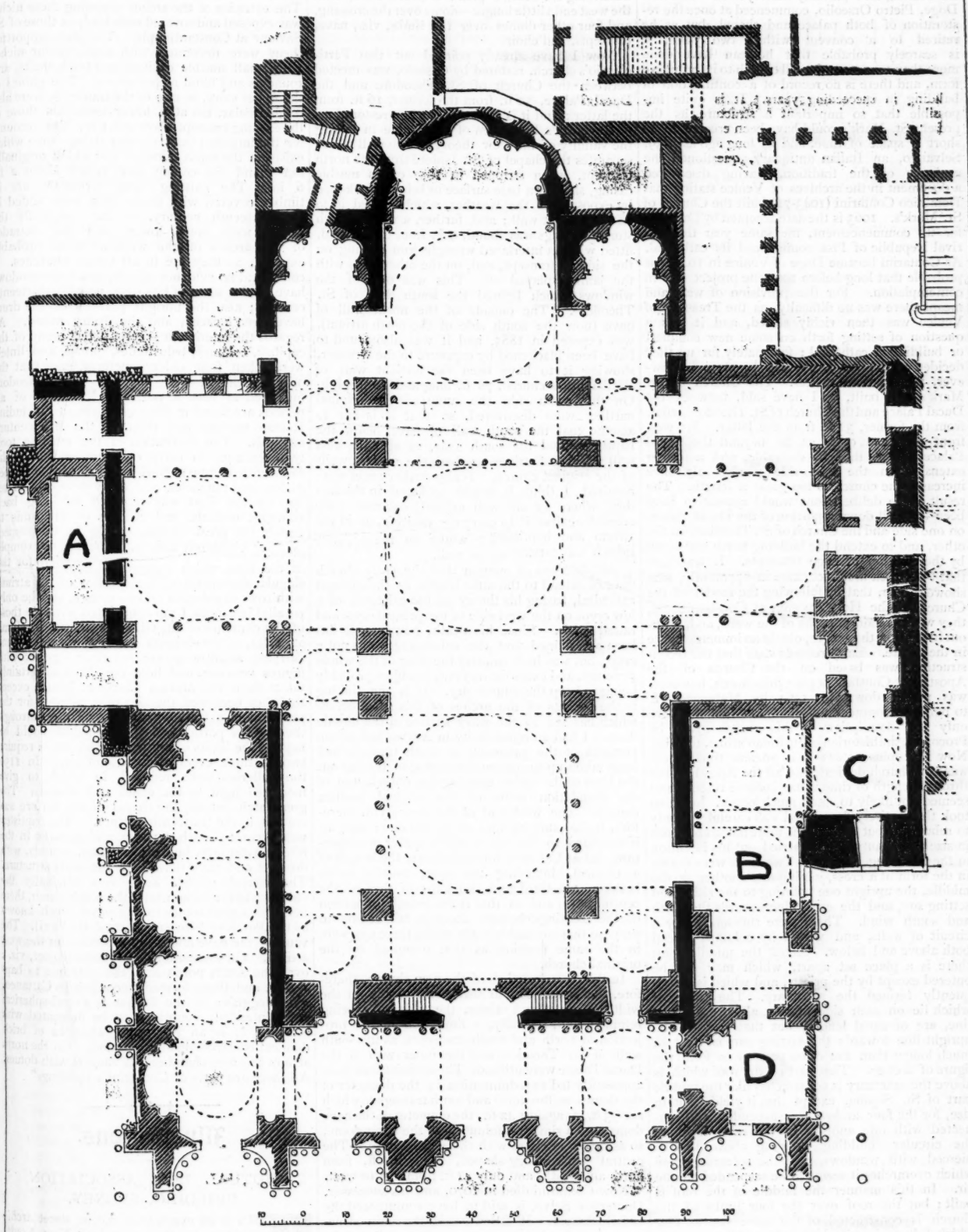
So far I have dealt with churches and other buildings. I have now to direct your attention to what I have called church furniture in screens, ciboriums, ambones, &c. There existed prior to 1873 a bridge near Rome called the Ponte Salaro, which was built by Narses, Justinian's general, on the foundations of a Roman bridge. Its interest laid in its showing the Byzantine method of building parapets. Square upright posts of stone or marble are sunk at intervals, the interspaces being filled with slabs of marble which are fixed in grooves worked in the square posts (see cut, p. 49). The posts are sometimes plain and sometimes moulded or sunk in panels; the decoration is found in the panels, and those of the Ponte Salaro have designs on them similar to many examples in St. Sophia and elsewhere.* In the Church of St. Clemente at Rome, the enclosure of the choir (which projects far into the nave) is formed of upright marble posts panelled, and slabs of marble which were removed from the more ancient church, the walls of which have been discovered below the existing one. In 1858, when the lower church was discovered, an inscription was found on a marble architrave which enabled M. Cattaneo to fix the date at 514-25, and the sculptural decoration on a column found with it was of the same epoch as the panels of the screen. This parapet or screen is therefore the earliest dated example in Italy of that peculiar interlaced decoration of which so many examples exist in Ravenna, and which was either imported from Constantinople, or was carved by Byzantine workmen. Of these interlaced panels there are at least eight in Ravenna; four perfect examples are now in the Cathedral, having been preserved when it was rebuilt. Three are in St. Apollinare Nuovo, and one in the museum. There are some in Rome, cited by Cattaneo, and a more diligent research might reveal the existence of others. They are all types of that peculiar interlacing pattern which influenced Lombard architecture down to the end of the twelfth century, and which, even up to the fifteenth century, in Venice, Verona, and other towns near crop up occasionally. The Renaissance parapets in Verona and Venice owe their origin to this simple but highly decorative method of enriching a pierced parapet.

The buildings or features which I have already quoted were executed in the fifth and sixth centuries. In 566 A.D. Italy was subject to a series of disasters. The plague, great floods, intense cold, swarms of rats, and clouds of locusts followed one after the other, and in addition to these troubles there were constant incursions of the Northern barbarians, followed by slaughter, pillage, and general destruction. All this put a stop to the cultivation of art, and either killed off or exiled those foreign artists who, with their families, had settled in the country. A century and a half passes without the production of any works except of a barbarous character. A revival seems to have taken place in the beginning of the eighth century, when Liutprand occupied the throne of Lombardy. About this time, 726, the first edict of the Iconoclasts was promulgated, and a considerable immigration of Greek artists into Italy took place (it is possible also that the Mahometan invasions exiled some from Syria); their work would seem to have been confined more or less to the decoration of apses with mosaics, and to such ornamental works as ciboria or baldacchinos, ambones or pulpits, choir enclosures, &c. Of these the most remarkable are the ciboria at Valpolicella, Cividale, St. Apollinare in Classe, and other places, the greater number of which are now in museums. The most important church built, and which still remains fairly perfect, is that of St. Maria-in-Cosmedin at Rome, 772-95, and as it was built for the Greeks who had been exiled by the Iconoclasts, and is the first example in Italy of a church with three apses, we may fairly ascribe that feature to Byzantine influence, though, as I have before observed, in the Greek church the side apses are not dedicated to any saint, and, in fact, are hidden by the Iconostasis. The Church of St. Salvatore at Brescia (the finest work from which is now in the museum there), and the crypt of St. Philaster under the east end of the Rotonda, are the only two structures out of Rome belonging to this century which seem to have retained their ancient plan. They are more numerous in the ninth and tenth centuries. At Rome the Church of St. Maria in Domenica is the only one which has preserved its original basilican plan with three apses—(I am, of course, only speaking of those in which I recognise the Byzantine influence)—The chapel of St. Sativo at Milan, which is like a small Greek church,—St. Vincenzo in Prato at Milan; a church which has just been restored, having been closed for more than a century: it is a simple basilican church, with nine arcades on each side carried on columns and capitals with dosserets, some taken from ancient buildings and others carved for the church—three apses and a crypt with choir one rising from 7 ft. to 8 ft. above the nave; the baldacchino also dates from the ninth century, being somewhat similar to the example in St. Ambrogio.—The church of Agliate, near Milan, dates from the same period, and consists of nave without aisles. There also is a baldacchino, and it is curious that in all these three, viz., St. Vincenzo, St. Ambrogio, and Agliate, the raised interlaced ornament of the upper portion is in stucco or plaster, painted and gilded. The rich archivolt decorations of the narthex of Agliate are also in plaster, as also are those of the church at Cividale,—the church of St. Agata, St. Francesco, and others in Ravenna,—portions of St. Eustorgio at Milan (but much altered in the twelfth century); the exterior of the apse of St. Celso at Milan,—the apse with triforium gallery of St. Stefano at Verona,—the churches of St. Euphemia and St. Giovanni decollato at Venice, the latter with elliptical arches in nave, which are said to exist in the Cathedral of Caorle, to the north-east of Venice. This egg-shaped form of arch is one which was largely adopted by the Sassanians, but I have come to the conclusion that the resemblance is accidental, and that instead of stilting the arch at St. Giovanni, to bring its crown on a level with that of the last and wider arch of the nave, they made it elliptical.

The chief interest of all these examples of the ninth and tenth centuries lies in the fact that they constitute the early examples of Lombardo-Byzantine work. The great artists who came over during the Iconoclastic persecution remained only till the end of the eighth century, and the Lombards were then left to themselves to work out their own style. When compared with the finer works of the fifth and sixth centuries at Ravenna, these later examples show a miserable falling off. Whenever possible they utilise old materials, so that in all these churches (which are of the usual basilican type, with nave and aisles separated by arcades, carried on columns, and out of Rome invariably with the dosseret above the capital) we find old capitals used up with a few new ones of coarse and naïve execution in imitation of the old examples. The triple apse reigns throughout, and here and there we come across the polygonal exterior to the apse as in St. Fosca Torcello, at Murano, in the side apses added afterwards to St. Apollinare in Classe, and the extended one in St. Apollinare Nuovo. There is invariably a crypt, which, in some cases, is only a few steps down from the nave, resulting in a raised choir as in St. Ambrogio and St. Vincenzo in Prato, Milan. The principal treasures of these churches are the sculptured parapets of the choir—the ciboriums and the pulpits, and in churches of later date, as well as in museums, we find richly carved slabs, as in St. Abondio, Como, and capitals, as in St. Giovanni in Valle, and St. Stefano in Verona, and, although of far less beauty than the earlier Greek examples, exhibiting an interesting and naïve revival of interlaced work, scrolls, and the more favoured patterns of the vine and grapes, which is found in twelfth and thirteenth century work, and even later.

I now come to the Cathedral of St. Mark's, Venice, a building which, inspired throughout by Byzantine work, and of which the main design was certainly due to a Greek architect, seems to me to have exercised the greatest influence on the Lombardian architecture of the twelfth and succeeding centuries. The early history of the present cathedral and of its predecessors has been traced by Cattaneo, to whom I am chiefly indebted for my information. It commences with the recovery of the body of St. Mark by Giustiniani Participazio in 829. In that year the Mahometans of Egypt had determined to pull down the Church of St. Mark at Alexandria, and the Doge Participazio succeeded in obtaining the relics of the saint in whose memory it had been erected. Nothing remains of this church at Alexandria, but it is believed to have occupied the site of the present Lazaretto. Giustiniani Participazio intended to erect a church worthy of these relics, but died before it was commenced, leaving the task to his brother, Jean Participazio, who succeeded him as Doge of Venice. The church was built between the site of the then existing Ducal Palace and the Church of St. Theodore, which had hitherto been the chapel of the Ducal Palace. The church he built was probably of the usual basilican type, and in it were used up the marble columns and capitals which his brother Giustiniani had exported from Sicily after his conquests there. It is probable, also, that some of the materials were obtained from the ruined cities of Heraclea, Altino, Concordia, and others, for examples of all periods are found in the present church. In 976 the Ducal Palace was set fire to by an enraged populace, and the Doge, Pietro Candiano, was killed. The fire spread to

*Only the Roman foundations and the small Byzantine archway on each side are preserved in the existing bridge, which was rebuilt in 1873.—R.P.S.



Historical Plan of St. Mark's, Venice, distinguishing the different dates of work.—From a Coloured Plan by Mr. R. Phené Spiers.

Ancient work prior to 1063.

Domenico Contarini, 1063—1071.

Decoration (Marbles, Mosaics, &c.), 1100—1350.

Work done about 1300.

Renaissance.

A. Chapel of St. Isidore.

B. Baptistery.

C. Treasury

D. Chapel of St Zeno.

St. Mark's, and partially destroyed it. The new Doge, Pietro Orseolio, commenced at once the restoration of both palace and chapel, but as he retired to a convent within two years, it is scarcely probable that he can have done more than to restore the old church to its primitive form, and there is no record of a continuation of building in succeeding years. It is quite impossible that so important a structure as the present St. Mark's could have been erected in so short a space of time, and as long ago as 1859, Selvatico, an Italian antiquary, questioned the accuracy of the tradition, having discovered a document in the archives of Venice stating that Dominico Contarini (1043-71) built the Church of St. Mark's. 1063 is the date accepted by Cattaneo for its commencement, the same year that the rival Republic of Pisa commenced its cathedral. As Contarini became Doge of Venice in 1043, it is probable that long before 1063 the project was in contemplation. For the provision of ways and means there was no difficulty, as the Treasury of Venice was then richly stored, and it was a question of setting forth on some new conquest or building a cathedral; fortunately for us they decided on the latter. Where to place it, however, was another matter. The Church of St. Mark's was built, as I have said, between the Ducal Palace and the Church of St. Theodore, 16 ft. from the former, 32 ft. from the latter. Its west front projected quite as far beyond the Ducal Palace as was thought desirable, and a further extension on the east side would only have increased the church to too great a length. The result of the deliberations would appear to have been—to pull down a portion of the Ducal Palace on one side and the Church of St. Theodore on the other, and to extend the building north and south by the addition of huge transepts. It was here that the Greek architect came in apparently, who showed them, that by following the model of the Church of the Holy Apostles at Constantinople, they would retain portions of the walls, and, without increasing the length, obtain an immense space in the centre. Early records state that the reconstruction was based on the Church of the Apostles at Constantinople; this church, however, was pulled down in 1464 by Mahomed II. to build a mosque on the site, so that we have only the description of this church given by Procopius, the historian of Justinian's time, to go by. Now Procopius states: "In ancient times there was one church dedicated to all the Apostles, but through length of time it had become ruinous and seemed not likely to stand much longer. Justinian took this entirely down, and was careful not only to rebuild it, but to render it more admirable both in size and beauty. He carried out his intention in the following manner: Two lines were drawn in the form of a cross, joining one another in the middle, the upright one pointing to the rising and setting sun, and the cross line towards the north and south wind. These were surrounded by a circuit of walls, and within by columns placed both above and below. About the middle point there is a place set apart, which may not be entered except by the priests, and which is consequently termed the sanctuary. The transepts which lie on each side of this, about the cross-line, are of equal length, but that part of the upright line towards the setting sun is built so much longer than the other part as to form the figure of a cross. That part of the roof which is above the sanctuary is constructed like the middle part of St. Sophia, except that it yields to it in size, for the four arches are suspended and connected with one another in the same fashion; the circular building standing above this is pierced with windows, and the splendid dome which overarches it seems to be suspended in the air. In this manner the middle of the roof is built; but the roof over the four limbs of the church is constructed of the same size as that which I have described over the middle, with this one exception, that the wall underneath the spherical part is not pierced with windows." Now Procopius was not an architect, therefore we must read between the lines of his description, and when he says the church was surrounded within by columns placed both above and below he is evidently referring to the columns of aisles and triforium galleries, as in St. Sophia. If that reading be accepted, then the only differences between St. Mark's and the Church of the Apostles are—first, there is only one range of columns, viz., in the lower story which carries the gallery, and the upper range of column in wall with windows above, as in St. Sophia, is omitted, the windows being in the outer wall above the aisles. Secondly, there are windows at St. Mark's in the four other domes. Thirdly, the galleries were replaced by narrow passages in the thirteenth century. Otherwise, he might have been describing St. Mark's plan: a Greek cross, with the west end a little longer—dome over the crossing, and four other domes over the limbs, viz., nave, transepts, and choir.

Now I have already pointed out that Participazio's church, restored by Orseolo, was erected between the Church of St. Theodore and the Ducal Palace, 32 ft. from the former, 16 ft. from the latter; and it is here that the late restorations of St. Mark's have been of such value in testing the validity of the new theory. The wall which separates the chapel of St. Isidore from the north transept, when stripped in 1887 of its marble casing, showed a bare surface of bricks, blackened by exposure to the weather, which proved it to be an ancient wall; and, further, a window with stone dressings was found, 9 ft. from the ground, fitted with an interlaced wrought-iron grating on the side of transept, and, on the other side, with the jambs splayed off. This was one of the windows which lighted the south aisle of St. Theodore. The outside of the north wall of nave (now the south side of the north atrium), was exposed in 1885, and it was also found to have been blackened by exposure to the weather, showing it to have been the ancient wall of Participazio's church, 76 ft. long and 26 ft. high. On the south side the antæ of the original narthex were discovered, so that it is fair to assume that the south wall of nave below the baptistery and the south aisle, as also the west wall at back of atrium, are both the ancient walls of the original church. If any further proof were required, I think it would be found in the fact that, where an old wall existed, columns were erected against it to carry the vaulting, as in the atrium and baptistery; whilst on the opposite sides it was carried on the wall.

Cattaneo was of opinion that the early church did not extend to the same length as the present cathedral, basing his theory on the existence of a low crypt on the west side of the present crypt and raised choir. Since his death, however, it has been ascertained that this substructure was not a crypt, but was built to carry the floor of the whole structure, and exists throughout, its object probably being to keep the church dry. It is the sinking in the pockets of the arches of this substructure which has led to the wavy surface of the mosaic floor. I had an opportunity in August last (when portions of the pavement in south transept had been taken up to restore the vaults) of tracing out the lines of the arches crossing the church and of the foundation walls of the original basilica church. The west end of the new crypt, therefore, is the same as that of the old one; how far it extended to the east is still a matter of conjecture, but as Cattaneo himself allows, the length of a chancel, including the apse, usually varies between one-third and two-fifths of that of the central nave, and as that is the actual proportion of the existing chancel, there is fair reason to suppose that the inside walls of the three apses are in the same position as that occupied by the original church.

In the reconstruction of the new church, therefore, there were certain restrictions, firstly, in the width of nave and aisles, the old walls being retained, and, secondly, a limitation in the projection of north and south transepts, as the south wall of St. Theodore and the inner wall of the Ducal Palace were utilised. These limitations have apparently led to a diminution in the diameter of the domes on the north and south transepts, which are 33 ft., as against 42 ft., the diameter of the nave dome, and a similar diminution in the choir dome, so as not to interfere with the central apse. The central dome is egg-shaped, being 42 ft. from north and south, and only 41 ft. from east to west.

Now Contarini died in 1070, and his successor, Domenico Selvo, is said to have commenced the embellishment. It follows that the main structure must have been completed, including the atrium, by that date, and Cattaneo is of opinion that owing to the immense resources they had the task was a possible one; but the structure thus completed bore a very different aspect to the St. Mark's we now see. Externally it was a plain brick building, like the present south transept, its decoration being confined to the brick arches, which with their deep voussoirs have a certain decorative character,—to small niches with marble shafts and capital to roundels, corbel tables, and stringcourses. I have endeavoured to make a drawing reproducing the original façade, my conception being based, first, on the walls of the existing structure, secondly, on the reproduction given in Ongania's work of those portions of the ancient structure which were exposed and copied by Mr. Scott during the restoration; and on Cattaneo's description. In front of the atrium were five rectangular niches and two small ones, one on each side of the central niches. The extrados of the arches spanning these niches was exposed and covered with lead, as those of St. Saviour at Constantinople. The piers supporting them were decorated with semi-circular niches with small marble capitals and brick shafts, and roundels and blind niches above. The gables of the upper story, as also of the transepts, were also semi-circular, but at a lower level than those of the existing transept, about 2 ft. 6 in. This accounts for the indented brick circular stringcourse which exists in the south transept, and which originally ran round the coping now raised about 2 ft. 6 in. The existing dome terminals are in timber covered with lead; they were added in the thirteenth century, so that originally the domes were much lower, and the extrados of the arches of the windows were probably exposed, as they are in all Greek churches. I could find no evidence of this, as all the windows have jambs, some of late date, possibly thirteenth century; also the upright portions of the drum have been refaced, and the drums raised. As regards the interior, it is certain that many of the capitals, columns, balustrades, jambs, and lintels were taken from older structures, and that the original church and that of St. Theodore furnished at least a portion. Examples of all periods are found in the present church, including Roman capitals and those of the fifth century onwards. The decoration of the exterior took two centuries to carry out, not including the fourteenth century florid work of the upper gallery and pinnacles, and every vessel which set out for the East was required to bring back columns, capitals, and marbles of all kinds to enrich the great church, which, in this respect alone, is absolutely unique. There is no example in the East which suggests a precedent for the singular decoration of the exterior of the atrium with rows of columns on two stories, and the only parallel instances I am acquainted with are those of the churches of St. Gilles and of St. Trophime at Arles, of the eleventh century, where columns carrying architraves are set close together with figures between, and here the idea was certainly taken from the Maison Carrée at Nîmes, except that they borrowed the idea of a peristyle for the purposes of a wall decoration. To go through the various portions of the cathedral would be beyond the limits of my paper, and would require two or three evenings instead of one. In 1150 the galleries were reduced in width to give increased light to the aisles and chapes. The great arch outside the chapel of St. Isidore was erected in the thirteenth century. The baptistery was decorated with marbles and mosaics in the fifteenth century, but the columns, capitals, with dosseret and vault date from the early structure. The chapel of St. Zeno was originally the entrance to the atrium from the south porch, there being also an entrance in the north porch known as the Porch of Flowers (Porta delle Fiori). The vault of the nave and aisles extends over the west atrium. On the south side two bays project, viz.: over the south porch and the entrance to baptistery, and these formed, according to Cattaneo, open loggias; in the former is a semi-spherical vault intended, doubtless, to be decorated with mosaic. It is an interesting example of brick domical construction of the period. On the north atrium are four chambers all vaulted with domes. All these are parts of Contarini's building.*

Illustrations.

MUTUAL LIFE ASSOCIATION BUILDING, SYDNEY.

THIS is an example of recent street architecture in the capital of New South Wales, but carried out by a firm of whom the leading member is an Englishman, known to many of our readers, who has been practising in Sydney for the last few years.

The lithograph is reproduced from a photograph taken from the executed building.

ST. MARK'S, AND BYZANTINE ORNAMENT.

THE elevations of St. Mark's, at Venice, as well as the illustrations of carved ornament, panels, and balustrades on two other plates, form a part of the illustrations to Mr. Spiers's paper at the Architectural Association on the "Influence of Byzantine Art in Italy," and must be taken in

* The remainder of the paper, together with some notes of the discussion and further illustrations, next week.

connexion with that paper, which we are giving in full, with some further illustrations next week.

The elevations of St. Mark, as will be seen, are an attempt to realise the condition of the building before it assumed its resplendent veneer, as one may call it, of marble and mosaic.

DESIGN FOR A SMALL COUNTRY HOUSE.

IT was intended to build this house on a site commanding an excellent view. To save expense everything would be simply treated, and, as far as possible, local bricks and tiles would be used.

The design, by Mr. G. C. Horsley, was exhibited at last year's Royal Academy.

STOKE NEWINGTON FREE LIBRARY.

THIS design was submitted in a limited competition for the above-named building by Mr. Ernest Rüntz, but was not placed, we understand, entirely in consequence of the reference-room being planned upon the first floor. The cost of the building was not to exceed 2,000*l.*, so that great care had to be exercised, considering the large amount of accommodation required at so small a cost. The plan itself is sufficiently explanatory without further description, and the arrangement shown left at the disposal of the Commissioners a large amount of additional ground for future extension.

In designing the elevation an attempt has been made to recall the style of numerous buildings which a generation ago were picturesque features in Church-street, Stoke Newington. It was in this street that Oliver Cromwell once lived; the house he occupied was pulled down some twenty-four years ago. Daniel Defoe also was a resident not far from the site of the library in question, and the house adjoining the main entrance of the library gives some indication of the nature of the buildings which have so rapidly disappeared of late years under the hands of speculative builders.

Simplicity and directness was the aim in the planning as in the elevation; in the latter the disposition of the window openings indicates the portion of the building devoted to the public and that for private purposes.

The drawing from which our illustration was taken was exhibited at the Royal Academy last year.

COMPETITIONS.

NEW CHURCH SCHOOLS, WITTON, NORTHWICH, CHESHIRE.—About a dozen competitors sent in plans and designs for these schools. The designs were submitted to Mr. Douglas, architect, Chester, as assessor, who found that all of them would exceed in cost the amount named, 2,500*l.* He, however, selected three designs, under the mottos "Pro Ecclesia," "Cheshire," and "Economy," which he recommended as approaching the nearest to the desired conditions. We understand that the committee have selected the design of "Pro Ecclesia" (by Mr. M. K. Ellerton, architect, Northwich).

ARCHITECTURAL SOCIETIES.

THE ARCHITECTURAL ASSOCIATION (DISCUSSION SECTION).—The fifth meeting for the Session 1892-93 was held at the Rooms of the Association on Wednesday last, when Mr. William Pywell, A.R.I.B.A., read an interesting paper, the subject of which was "The Planning of Hospitals for Infectious Diseases." Mr. P. Gordon Smith, F.R.I.B.A., Architect to the Local Government Board, kindly attended as Special Visitor, amongst others present being Mr. Christopher Harston and Dr. Richards. Mr. S. B. Beale, the Chairman for the Session, occupied the chair; and there was a good attendance of members.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At a well-attended meeting of this Association a paper was read by Mr. A. T. Bolton, on "Some Elements of Domical Architecture," deduced from a survey of the later churches of the Italian Renaissance. The dome was shown by the author as as much the basis of a style of architecture as the vault; the two systems were then compared, and the special qualities of the dome as an architectural element were considered. The lecturer then showed how the dome was modified to suit the existing church plan handed down from the Middle Ages, and illustrated his argument from twelve examples drawn on a uniform scale in plan and section from the cities of Milan, Padua, Ferrara, Venice, &c., the examples being divided into two types, the domical church and the five dome plan—the former being the result of the use of the dome in a simple plan, and the latter a form complete in itself. Each example was commented upon, and its relative importance explained; and, in conclusion, it was pointed out that domical architecture is not a question of style but of structure in an artistic sense, capable of any treatment in detail, as in Byzantine, Renaissance, and also Romanesque examples as in the new Church of the Sacred Heart at Paris. Attention was also called to the possible use of domical architecture in buildings other than churches.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of the Edinburgh Architectural Association was held on the 11th inst. in the Royal Institution, Princes'-street, Edinburgh, Mr. W. W. Robertson, President, in the chair. After some formal business had been transacted, Professor Baldwin Brown read a paper on "Bronze Doors and their Artistic Treatment." He began with some general remarks upon the subject of design, as illustrated by the principal bronze doors of which art history took account, and in this connexion laid special stress upon the importance of considering the characteristics of different materials and processes as a preliminary to design. Here he described and illustrated, by means of lantern transparencies, a number of famous bronze doors. A classical bronze door he explained to be a copy in bronze of a panelled door in wood. Mediæval bronze doors, he showed, fell into three groups—firstly, those found in Saxony; secondly, those found in Southern Italy; and, thirdly, those met with in Tuscany. The first two groups belonged to the eleventh and twelfth centuries: whilst the third group belonged to the centuries from the thirteenth till the sixteenth. Views of characteristic examples of all three groups were afterwards thrown upon the screen, and their salient features pointed out. At the close, Professor Baldwin Brown was cordially thanked for his paper.

GLASGOW ARCHITECTURAL ASSOCIATION.—At a meeting of the Glasgow Architectural Association held on the 16th inst. Mr. H. C. Shelley read a paper on "Some Scottish Castles." Mr. Campbell Douglas, the President, occupied the chair. Mr. Shelley dealt with about twenty of the castellated structures, situated chiefly in the western district of Scotland, which illustrated the various styles of structure which had prevailed since the twelfth century.

LONDON COUNTY COUNCIL.

THE first meeting of this Council after the Christmas recess was held on Tuesday afternoon last at Spring-gardens, the Chairman, Mr. John Hutton, presiding.

The Comptrollership.—The General Purposes Committee presented a long report in reference to the office of Comptroller, rendered vacant by the resignation of Mr. Gunn through ill-health.* The report detailed the work at present carried on by the Comptroller's department. As showing the responsibility attached to the office of Comptroller, the report pointed out that the expenditure which he supervised annually amounted to nearly 3,000,000*l.*, that the gross debt of the Council amounted to 30,000,000*l.*, and that the money passing through the Consolidated Loans Fund exceeded 2,000,000*l.* The Committee recommended that the salary of the Comptroller be fixed at 1,500*l.* a year, and that the Council advertise the post.

The Rev. Fleming Williams moved, as an amendment, that the salary offered should be 1,000*l.*, rising by annual increments of 50*l.* to 1,200*l.*

A long discussion followed, and on a division the amendment was rejected by 54 votes to 47.

Mr. Burns, M.P., then moved, as a further amendment,

"That some member of the existing staff be promoted to the office of Comptroller, and that it be referred to the General Purposes Committee to recommend the officer who should be appointed, and the salary which he should receive."

Mr. Torr opposed the amendment, contending that the proper course was to advertise the vacancy, and those engaged in the department being eligible applicants, they would thereby secure the best man.

On a division, the amendment was rejected by 53 to 39, and the report of the Committee was then adopted.

Hackney to Holloway Storm Relief Sewer.—The following paragraph and recommendation appeared in the Main Drainage Committee's Report:—

"On the 28th of June last the Council directed the preparation of detailed plans of the proposed extension of the Hackney to Holloway storm relief sewer from Hackney station to Sandringham-road. The Engineer has now presented to us the drawings of the proposed extension, and he has further by our direction had the specification and quantities for the work prepared. We are of opinion that this work should be executed with as little delay as possible, and as we understand that the Works Committee are at this moment fully occupied, we recommend—

'That, subject to an estimate being submitted to the Council by the Finance Committee when tenders are received, an advertisement be issued inviting tenders for the work.'"

The consideration of this matter was postponed for a week.

Dismissal of a District Surveyor.—The Building Act Committee submitted the following special report, dated December 19, 1892:—

"We have to report that Mr. Henry Parsons, District Surveyor for Lambeth (South) and part of Camberwell, was convicted by the magistrate sitting at the Lambeth Police Court on September 9, 1892, of having, with intent to defraud, travelled on the London and South Western Railway on June 28 and 29 last without having previously paid his fare. He was fined 2*l.* and ordered to pay 5 gs. costs in each case.* Having carefully considered all the facts laid before us, and seen Mr. Parsons and his solicitor, we regret to feel that we have no other course open to us than to recommend the Council to dismiss Mr. Parsons from his office. We recommend accordingly—

'That Mr. Henry Parsons be dismissed from the office of District Surveyor of the southern division of Lambeth and part of Camberwell.'"

The recommendation was unanimously agreed to, without discussion.

After transacting other business, the Council adjourned at 7 o'clock.

Correspondence.

To the Editor of THE BUILDER.

THE NEW RAILWAY RATES.

SIR,—You will, we feel sure, permit the pages of your journal to be open for protest against the monstrous charges now imposed upon us in our particular branch of the building trade. As an instance of the unjust and unreasonable advance in these rates, we may refer to a communication from a London customer where the rate has been increased from 8s. per ton to 18s. 6d.

We do not think anything has exceeded this in any of the rates cited by the many correspondents in the daily papers. However, in addition to this we are informed by the railway agent that in future fourteen cubic feet of Portland stone is to be reckoned a ton instead of 16 ft. as heretofore. This is ruinous and ought not to be tolerated, and everyone interested in the building trade should protest in the strongest manner possible against it. We hope our claims to consideration will be fully represented at the proposed conference shortly to take place at the Mansion House, which we understand is to be held with the view of ascertaining the effect of the new rates on the trade of the country. The rate for Portland stone to London and neighbourhood has always been too high, and the reason of it may be supposed to be the result of one company having well nigh the sole monopoly. However, when large consignments are threatened to go by water they quickly make concessions and quote a special rate. This, Sir, we submit is not fair to London contractors generally, many of whom may be during the same time taking quite as large a quantity though possibly not for one job. Such an arrangement certainly gives the man with the special rate considerable advantage over his less fortunate brethren in the trade.

We had hoped that these new arrangements would have been beneficial to trading and commerce generally. However, we now feel pretty certain that such a storm will be raised in opposition to them as will lead to a much more satisfactory result.

WEBBER & PANGBOURNE.

Easton Steam Saw Mills and Masonry Works, Portland.

ST. GEORGE'S HALL, LIVERPOOL.

SIR,—Let me correct another slight error in Mr. Goodchild's letter. The organ exhibited by Mr. Willis at the Exhibition of 1851 was transferred, not to Liverpool, but to Winchester Cathedral, where it still remains practically unaltered, save by the addition of mechanical blowing.

The magnificent instrument in St. George's Hall is entirely the design of Mr. Willis and the late Dr. Wesley. It has been slightly altered, and re-tuned

* See *Builder* for October 8 last, p. 285.

* See *Builder* for October 1, 1892, p. 259.

to the "equal temperament": and, in the opinion of many competent judges, is still the finest instrument we possess. On my last visit a few months ago, the organ concerts seemed as popular as ever.

VIATOR.

*** Mr. Goodchild's statement escaped our notice, or we should have corrected it. We quite concur with our correspondent in his estimate of the instrument, the finest modern large organ in England.—ED.

THE STUDENT'S COLUMN.—Owing to pressure upon our space this week, we are obliged to hold over the third instalment of the "Student's Column." We will give a double instalment next week.

GENERAL BUILDING NEWS.

NEW WING, BOARD SCHOOL, SHEFFIELD.—On the 9th inst. a new wing in connexion with the Derbyshire-lane Board School, Norton, Sheffield, was opened by Mr. E. M. E. Welby. The new wing will seat 250 children, and the whole school has accommodation for 500 scholars. The school was originally a mixed one, but now it has been divided into separate departments for boys, girls, and infants. Building operations were commenced last June. Mr. T. H. Wilson, of Sheffield, was the architect, and the contractors for the building and joinery were respectively Messrs. H. Harrison and J. Benson, of Greenhill. The entire cost of the extension is 2,407*l.* 15s. 6d.

RESTORATION OF CHACEWATER CHURCH, CORNWALL.—The Church of St. Paul, Chacewater, was re-opened on the 20th ult., after undergoing restoration. The old church was erected, says the *Western Morning News*, sixty-five years ago, and it consisted of a parallelogram 90 ft. long and 53 ft. wide, exclusively of the western tower, and a small eastern projection 15 ft. wide, and only 7 ft. deep, which formed a chancel, whilst a narrow projection of 18 in. in the middle of the north and south walls did duty as transepts. The tower at the west end opened into the church by a lofty arch, and vestries were formed by two erections of wood at the east-end of the aisles. The new building consists of nave and chancel, with north and south aisles to both, and the old western tower has been retained to do duty until something better can be provided. The nave is 62 ft. long and 24 ft. wide, the total length being 110 ft. and the extreme width 53 ft. The enclosing walls of the old church were no less than 30 ft. high, and were pierced by two tiers of windows with wooden frames above and below the galleries. The north and south walls have been lowered to the height of 14 ft., the window openings being retained and new granite three-light windows with cusped heads inserted. These walls are connected with the new clearstory walls over the new arcades by a lean-to roof, thus forming north and south aisles. New foundations had to be provided for these arcades. The arcades are of local granite, except the shafts of the piers, which are of Polyphant stone. The springers and bases are of solid granite slabs. The clearstory walls are built of the old stone from the upper part of the original walls, and are pierced by one light cusped-headed windows of Polyphant stone. Above, at a height of 31 ft. from the floor, the wall plates carry an open barrel roof of the old Cornish type. The fifth bay of the arcades is included in the chancel, and separated from the nave by a low screen of granite and Polyphant stone, the roof above being boarded and panelled. The shallow east end projection has been formed into a sanctuary, and opens into the chancel by a granite and Polyphant arch, the roof being covered within and covered externally with red tiles, the rest of the church being covered with blue slates. The east window is the old east window of the parish church of St. Mary, Truro, and has been given to the parish of Chacewater by the rector and vestry of the new Cathedral Church. It is executed in Portland stone with five lights, and its old stained glass, executed early in the present century by Warrington, has been restored by Messrs. Fermiloe, of London. The rest of the glazing has been carried out by Messrs. Solomon, of Truro. The interior of the church has been pointed throughout. The tower remains in its original state structurally, but the old wooden windows have given place to the new traceried windows of granite or Polyphant stone. The seating throughout is new, the nave seating being of red deal, not stained, with traceried ends. The chancel seats are of oak, and were executed by Rashleigh, Pinwill & Co., of Plymouth. The pulpit is composed of various coloured serpentine marbles. The lectern is of oak, and consists of a large figure of St. Paul. It was executed by Mr. Harry Hems, of Exeter. The new oak altar is divided in front into three panels, of which the centre is the largest. It is spanned by a segmental arch enclosing three panels, the middle panel containing a cross. The contractor for the whole work is Mr. W. H. Moyle, of Chacewater. The church has been heated by Messrs. Longbottom. The sub-contractor for the masonry work was Mr. John Odgers, of Redruth. The granite work was supplied by the Granite Company at Carnmarth, and the Polyphant stone by Mr. Nicholls, of Polyphant, near Launceston. The architect for the reconstruction was Mr. Edmund Sedding, of Plymouth.

PROPOSED MUNICIPAL BUILDINGS FOR CREWE.—At a meeting of the members of the Crewe Town Council on the 12th inst., it was decided to purchase the Foresters Arms Hotel and an adjoining shop in Earle-street, from the North Cheshire Brewery Company, to provide a site for the erection of new municipal buildings. The acquisition of this property will give the Corporation a complete block of buildings contiguous to the Market Hall, Corn Exchange, and Fire Station; and it is contemplated to provide, besides Corporation offices, a technical school.

PROPOSED NEW POLICE OFFICE AT GLASGOW.—According to the *Scotsman*, operations are about to commence for the erection of a new police station for the southern district of Glasgow. A site has been secured at the corner of Nicholson-street and Oxford-street, and designs for the building have been prepared by Mr. A. B. M'Donald, the City Engineer. Outwardly, the Italian style of architecture has been adopted, and the white freestone of Giffnock quarries will be used in the construction of the walls. To Nicholson-street the elevation will be three stories in height, and to Oxford-street two stories; but as the court-room, with a lofty roof, is to be situated on the upper story in the latter street, the height of the exterior of the building will be nearly the same all over. There will be fifty-five cells, giving accommodation for 160 prisoners, and also the usual rooms for the police officials of the district. A part of the building will be utilised as barracks for thirty men, consisting of kitchen, mess-room, baths, and reading and recreation room, and a separate bed-room for each man. In the rear of the buildings there will be a large open quadrangle for drilling the men, with a commodious muster-hall on one side of it. The offices of the Lighting Department and of the collector of police rates for the district will also be situated in the building. It is estimated that the total cost will be about 25,000*l.*, and it is expected that the new station will be ready for occupation in two years.

RE-OPENING OF BATHS, EDINBURGH.—On the 12th inst. the re-opening of Drumsheugh Baths, Lynedoch-place, took place, the reconstruction of which was rendered necessary by the destruction of the original buildings by fire about a year ago. As originally planned the building was adapted for the purpose in view, and in the work of reconstruction the architect, Mr. Burnett, of Glasgow, followed the design proceeded upon in the first instance. Special attention, it is stated, has been devoted to the planning and fitting up of the part of the establishment devoted to the Turkish bath, and to the ventilation of the heated chambers. The swimming-bath is 70 ft. long and 35 ft. broad, with a depth of water of from 2 ft. 6 in. to 7 ft. The hall in which the bath is constructed is a lofty apartment, and one side of it is fitted up as a gymnasium, with suitable appliances.

NEWPORT (MON.).—On the 8th inst. a large congregation assembled at the Catholic church of St. Michael the Archangel, Pill, to celebrate the erection of the new tower, spire, and belfry. The church itself was opened about five years ago. The new ring of eight tubular bells are on Harrington's patent, and are worked on the keyboard system. The new structures are of Gothic design. The tower stands at the south-west of the church, facing Clarence-street. To the height of 30 ft. the base is of Pennant stone, with Bath stone dressings. The new portion is entirely of Bath stone. Its first tier is formed of moulded strings and traceried panels. At each angle of the tower rises an octagonal turret and pinnacle. The spire is octagonal, and rises on four sides from the embattlements of the tower; on the other side it springs from arches turned over at angles of the tower. Mr. W. B. Gardner was the architect, and Mr. Lewis Hall (Maindee) the contractor.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, PENISTONE.—On the 5th inst. a Local Government Board inquiry was held at Penistone by Rienzi Walton, Esq., M.I.C.E., to consider an application from the Local Board to borrow 3,000*l.* for waterworks purposes. The Penistone Local Board have a very good well yielding a large supply of water, but their pumping machinery is unsufficient and ineffective. It is proposed to put down an additional boiler with pumping house and pumps to raise 30,000 gallons an hour a lift of 300 feet. The well had been tested and found to yield over 400,000 gallons a day. When the pumps were working there was still 17 ft. of water in the well. The pumps would provide for raising about 100 million gallons of water a year, including 40 million gallons which it is proposed to sell to Darton. Mr. W. H. Radford, of Nottingham, is the engineer to the scheme.

WATER SUPPLY, BROXBOURNE AND WORMLEY.—We are informed that Messrs. Bailey-Denton, Son, & North have been instructed by the Guardians of the Ware Union to prepare plans and specifications for the water supply of Broxbourne and Wormley, Herts. The supply of water is to be obtained from the mains of the Cheshunt Local Board, and a storage reservoir for the use of the combined district is to be made in the parish of Broxbourne.

LEIGHTON BUZZARD WATERWORKS AND SEWERAGE.—An inquiry was conducted at the Leighton Corn Exchange on Thursday, the 5th inst., by Mr. F. H. Tulloch, one of the Inspectors of the Local Government Board, with regard to the Local Board's application to borrow 20,000*l.* for the purposes of sewerage, sewage disposal, and water supply. A comprehensive account of the scheme was furnished by the engineer, Mr. H. Bertram Nichols, C.E., of Birmingham, who gave evidence in support of the application. In the water supply scheme it is proposed to obtain pressure over the town from a water tower. A well and boring has been sunk into the lower greensand and an adequate supply of water has been met with of excellent quality. The sewerage scheme is partly on the "Shone" system, and the sewage purification is proposed to be on the international process, combined with land filtration. The estimate for the water works is 8,000*l.*, and for the sewerage and sewage disposal works, 12,000*l.* On the termination of the inquiry the Inspector, accompanied by the Chairman and the Engineer, visited the various sites for water supply and sewerage purposes.

STAINED GLASS AND DECORATION.

WINDOW, CONGREGATIONAL CHURCH, OSSETT, YORKSHIRE.—Four large stained-glass windows have been placed in the Congregational Church at Ossett. The subjects are—Paul Preaching at Athens, the Day of Pentecost, Christ sending his Disciples forth to Preach, and Christ Preaching in the Synagogue. The work is from the studio of Messrs. Powell Brothers, Leeds.

WINDOW, UPTON PYNE CHURCH, DEVONSHIRE.—A stained-glass window has been unveiled in Upton Pyne Church, near Exeter, to the memory of the late Rev. Charles Stafford Northcote. The subject represented is our Lord blessing little children. The ornamental mounting of the main picture is in accordance with the architectural period of the building. The window is in design and execution the work of Mr. Frederick Drake, of Exeter.

MEMORIAL WINDOW, ST. PAUL'S CHURCH, HEATON MOOR.—A stained two-light memorial window has just been placed in the north nave of St. Paul's Church, Heaton Moor, to the memory of Esther Ann Cottrell. The subjects treated are Christ's injunction to Peter, "Feed My Lambs," and Christ's appearance to Mary after the Crucifixion. The work has been executed by Messrs. Thomason, of Manchester.

FOREIGN AND COLONIAL.

FRANCE.—The "Société des Femmes Artistes," which must not be confounded with the "Société des Femmes Peintres et Sculpteurs," opens its exhibition on Friday this week, at the Georges Petit Gallery.——M. Emile Soldi, sculptor, has executed a fine medal which has been offered by the Government to the Association of Students of Paris.——A retrospective exhibition of the works of Meissonier is being organised, which will probably be held after the sale of those of his works which are to be sold. It will include not only the master's well-known works, but a number of studies, sketches, and wax models, which have never been exhibited.——The Minister of Public Instruction has granted the use of the large galleries of the Ecole des Beaux-Arts to the Association of Parisian Journalists, for an exhibition in May next of portraits of eminent writers and journalists of the day.——The new Telephone building in the Rue Gutenberg is finished this week, but will not be furnished and ready for use before July. The building itself has so far cost 800,000 fr., and the telephone and other fittings will probably cost a million.——The remains of an ancient Gallo-Roman cemetery have been discovered at Argenteuil; jewels and funeral vases have been found among the remains.——Some fresco-paintings have been discovered in the church at Verneuil (Eure), of the fourteenth century. They represent the legend of the "Trois Morts a Trois Vifs," which figured also on the sculptured portal of the ancient church of the Innocents at Paris. The legend is contained in some old MSS. in the Bibliothèque de l'Arsenal.——M. Trabuco, the sculptor, is about to bring an action against the corporation of Nice, which accepted his design for a monument to Garibaldi, and has now thrown it over in favour of a model by M. Etex.

BERLIN.—Anton von Werner, who had resigned the presidency of the "Berliner Künstler Verein," has been re-elected with 155 votes, against the 115 which were given to Karl Becker, the President of the Prussian Royal Academy. The "Verein" was to have had the sole management of the future Berlin Art Exhibitions, but, owing to the society having been the scene of much unpleasant controversy, the Emperor will now not vest this responsibility entirely in that body, and will probably have the future exhibitions managed jointly by the Royal Academy and the "Verein."——A German Lutheran church is to be erected at Rome. Voluntary contributions have already brought together about 5,500*l.*, but this sum scarcely covers the cost of the site and the incidental expenses attached to the purchase. The building proper will cost 17,000*l.* The Government does not favour the scheme, out of courtesy to the Vatican.——Herr Rudolf Speer, the Master of the Royal Arts and Crafts Museum Schools, died at the early

age of forty-four. As an architect he was known as a member of the firm of high standing,—Messrs. Schmieden and Speer,—late Gropius and Schmieden. As a master he was much esteemed throughout Germany.——After much discussion as to the advisability of having an International Exhibition it has now been apparently decided that Berlin is only to have a National Exhibition of Industries. It is probable that the exhibition will be held in 1896.

LUCERNE.—The Federal Council of Berne has decided to build a large new central station at Lucerne for the Swiss Central Railway, the St. Gotthard Railway, the North Eastern, and the Simplon Railways. The cost of the building is estimated at nine million francs.

BUILDING AFFAIRS IN CHICAGO.—We learn from an American paper (the *Inquirer* of Philadelphia) that for some weeks the sub-committee of Chicago Councils which had that branch of the public business in hand has been consulting with architects and builders with a view to determining the exact height to which buildings could be reared without danger to the occupants. If reports are to be believed, the committee have gone far enough to warrant them in reaching the conclusion that hereafter no buildings shall be erected which shall be higher than twelve stories, or 160 ft. Several other reforms will be embodied in the report of the committee which has been at work on the question. No building inspectors will hereafter be appointed who have not served ten years in one of the building trades. They will not be appointed then until after they have passed an examination before a committee of three, representing the Builders and Traders' Exchange, the Institute of Architects, and the Buildings Trades' Councils respectively. This committee will serve without pay.

MISCELLANEOUS.

SOCIETY OF ANTIQUARIES.—At the meeting of the Society of Antiquaries on Thursday, January 12th, it was proposed by Sir John Evans, K.C.B., V.P., seconded by Sir J. C. Robinson, and carried *nem. con.*:—"That having regard to the fact that the window in the north transept of the cathedral church of Lichfield which has been destroyed was one of the most considerable and conspicuous of Bishop Hacket's works, and also the fact, as stated in Mr. Pearson's report issued by the Dean and Chapter, that it is proposed to lay out 5,000*l.* on raising the roofs put on the church by Bishop Hacket, though it would seem that the timbers are in sound and good condition, and it is only the slate covering that is out of repair, the Society of Antiquaries fails to see on what grounds the Dean of Lichfield asserts 'that there is scarcely any approximation to truth in either' of the statements contained in the resolution passed at the meeting of the Society on December 1st, and this meeting adheres to the opinion the society has already expressed."

ACCRINGTON TECHNICAL SCHOOL.—Mr. Morley, the architect of the design illustrated last week, encloses us a letter from Mr. Ross, of Accrington, requesting the correction of the statement that this is the "accepted" design. The circumstances, which we had forgotten at the moment, were explained in a letter from Messrs. Morley & Woodhouse, printed in our issue of October 15, 1892 (page 304). The assessor selected Messrs. Morley & Woodhouse's plans and they received the first premium, but the Committee threw over the assessor's award and commissioned the winner of the second premium, a local architect, "to prepare new plans for their consideration." The (unintentional) mistake was rather ours than Mr. Morley's; we should have said "First premiated design."

SUSPENSION BRIDGE OVER THE INDUS.—A frontier correspondent says that the most wonderful thing on the Gilgit-road is the suspension bridge thrown by Captain Aylmer over the Indus at the site of the permanent structure now building. The span is some 350 ft., and the materials used are nothing but telegraph wire, wood, and a few crowbars let into the rock and used to fasten the stays. It is the most startling structure to come across in the gorge of the Indus. The gallant constructor used to ride over it, but less enterprising mortals walk and admire the really extraordinary ingenuity displayed in the construction. Seen from a slight distance it seems to hang suspended in the air like Mahomed's coffin, so delicate do the ropes of telegraph wire which support it seem; when one is close it looks, with its numerous stays of wire fastened to points up and down the banks, as if it were a giant spider's web.—*The Indian Engineer.*

THE ELECTRIC LIGHTING OF OMNIBUSES.—The Bristol Electric Safety Lamp Company are carrying out the electric lighting of omnibuses for the London General Omnibus Company. The battery weighs about eight pounds, and is placed in a wooden box under one of the seats. The box is provided with two brass spring terminals which make automatic contact with the battery when it is let down into the box. The lamp is of a special manufacture, and is made as small as possible to allow of it being placed in the centre of the roof, and for the same reason the incandescent lamp is suspended horizontally instead of vertically. By this arrangement a maximum amount of light is obtained and risk of breakage is avoided. About seventy vehicles have been lighted up to the present time, and one hundred and forty will be finished by the end of the year.

THE BELGIAN DRAUGHT HORSE.—A report, with a number of illustrations, on Belgian draught horses, by the American Consul at Brussels, has (says the *Times*) lately been published by the Department of State at Washington. As builders and contractors are large employers of horses, the subject will be of interest to many of our readers. There are, it seems, two pure breeds of horses in Belgium—the Ardennes horse, from the Valley of the Meuse, and the Frisian, from the sea coast. The Brabançon horse is the issue of the two. These form the three main breeds of draught horses, and great care has been given to their breeding, and, with the exception of the English Shire horse, they are the largest draught horses in the world, being fine proportioned and with excellent legs and feet. The Ardennes horse is an excellent type of a light draught horse, and is perfectly adapted for mountainous regions. It is, however, rapidly disappearing, as the Luxemburg farmers prefer the heavy draught horse, and the introduction of large heavy stallions from Brabant and Hainaut has almost completely transformed the breed. For some years much attention has been devoted to the improvement of the Brabançon horse. The line of the back is now much straighter, the hind part longer, the neck and shoulders more proportionate, and the legs large and clean. Harnessed to the heavy carts of the country, which weigh about 3,000 lbs., it will pull on the level a weight of from 6,000 lbs. to 10,000 lbs., and will work from eight to ten hours daily. It is considered the best draught breed in the kingdom, and is absorbing all the others. The recent exhibitions prove that there are now no distinctly pure breeds in sufficient numbers to form classes by themselves, and that for practical purposes there are only heavy and light draught horses. The special characteristics of the former are stature, form, strength, and breed. They have less bulk and strength than the Clydesdale or Shire horse, but they are better bred and have more energy. They have more bulk and strength than either the Percheron or Boulonnais horse, with quite as much energy. At one time the Government maintained a number of stallions, but the system did not prove successful, and now horse-breeding is left to private enterprise, encouraged by a system of registration and prizes. A list of the chief breeders in Belgium is appended to the report.

LEAD-LINED IRON WATER PIPES.—Our New York contemporary, *Engineering News*, describes a lead-lined iron service pipe, which has recently been devised by Mr. J. W. Harrington, Superintendent of the Wakefield Waterworks in the State of Massachusetts. The object is to give all the advantages of lead pipe without using the large amount of lead necessary for pipe under heavy pressure. Ordinary iron pipe is used, and in this, thin lead pipe of smaller diameter is inserted, and then expanded to fit. The most interesting part of the arrangement is that which refers to the method of protecting the end of the iron pipe when cut. A special tool is used, which is inserted in the end of the pipe to press the lead against the iron. A thimble is then inserted and driven home by the tool, which trims off all the surplus lead and forms a lead bead at the end of the pipe. When a thread has been cut and the pipe screwed into a fitting, the thread which is on the fitting is made to screw against a beaded end on the thimble. In this way no part of the pipe is exposed to the action of the water. A company has been formed at Wakefield (Mass.) to manufacture this pipe.

ASPHALTE FOR RESERVOIR LININGS.—In a paper read before a recent meeting of the American Society of Civil Engineers by Mr. James D. Schuyler, the use of asphaltum for reservoir linings is advocated, and some interesting particulars are given in support of the principle. The material is said to be elastic, and not to crack; it is insoluble in water and acids, imparts no taste to water, and is easily kept in repair. A circular reservoir was partly excavated in light sandy soil and part in embankment. The slopes were 1 in 1, and it was paved at bottom and sides with cobble stones laid in mud. Over this a sheet of hot liquid asphalte from $\frac{1}{10}$ to $\frac{1}{8}$ in. thick was spread with brooms. After filling with water, one part of the bank settled 2 ft., but there was no leakage. In another case a first coat was laid in vertical sections 2 ft. wide, the mixture being 15 per cent. of asphalte and 85 per cent. of beach sand heated to 300 deg. Fahr., spread with rakes and tamped with hot irons. The neglect to paint the raw edge of previously laid sections caused cracks to appear a year after use. Strips of iron were driven into the slope at frequent intervals to attach the asphalt to the slope, and a second coat about $\frac{1}{8}$ in. thick of asphalt fluxed with 10 per cent. of mineral tar, heated to a temperature of about 250 deg. Fahr., was applied to the entire surface and smoothed with hot irons.

A "HALLADAY" WINDMILL has recently been erected at Ryde, Isle of Wight, for Lieut.-Gen. Somerset G. Calthorpe. It is pumping water from a dug well 130 ft. deep, and forcing it into an elevated tank, situated about 40 ft. above the ground, from which the mansion, bailiff's house, stables, farm and surrounding property are supplied. The work was carried out by Messrs. Alfred Williams & Co., of London.

THE ENGLISH IRON TRADE.—Although practically little change has taken place in the English iron and steel trades, there is a slight hardening tendency in prices of crude material in one or two districts. The Glasgow warrant market is more animated; but the business done is generally on account of the cornering of the "bears." Scotch makers' iron is somewhat irregular in price, and quiet; and Cleveland pig is a shade lower. Finished iron is still in limited request; but a slightly brisker demand is experienced for tin-plates, and in steel rather more activity is reported. Old materials are, however, depressed. Shipbuilders and engineers do not exhibit much change. The coal trade is fairly active.—*Iron.*

AMALGAMATION OF DISTRICTS UNDER THE BUILDING ACT.—Mr. Henry Lovegrove, District Surveyor of South Islington, Shoreditch, and Norton Folgate, asks us to state that the office for the amalgamated districts is at No. 314, Old-street, E.C., which has been the Shoreditch district office for nearly fifty years.

"N. A. A." STUDENTS' ARCHITECTURAL SKETCHING CLUB.—This club, called the "Northern Architectural Association" club, whose headquarters are at Newcastle-on-Tyne, is holding an exhibition of architectural drawings at its meeting on Tuesday the 24th.

LEGAL.

ACTION BY A CONTRACTOR:

DICKINSON *v.* THE RICHMOND MAIN SEWERAGE BOARD.

THIS was an action (tried in the Queen's Bench Division before Mr. Justice Wills and an Assessor) for work and labour done and material provided and money expended in the construction of the Richmond Main Drainage Works, also for damages for breach of contract. According to the *Times*' report, the hearing of the case took place in June last, before the learned Judge, assisted by Sir Douglas Fox, as Assessor, when judgment was reserved. The plaintiff, since deceased, was a contractor, and on August 4, 1888, contracted with the defendants to construct certain sewers in the parishes of Richmond and Mortlake, for the sum of 40,666*l.*, according to specifications annexed to the agreement, which provided that the sewers were to be constructed according to the orders and directions of the defendants' engineer, and completed in eighteen months. On August 28, 1888, the defendants' engineer gave the plaintiff notice to commence the works, which he accordingly did. On September 28 the defendants' engineer ordered the line of sewers on the drawing to be altered, the altered line going through private property belonging to Mr. Poupart. The plaintiff's case was that, although he repeatedly asked the defendants and their engineer to procure for him liberty to enter upon Mr. Poupart's land, he was stopped by Mr. Poupart and prevented from proceeding with the altered works. It was further alleged that it was agreed that between Gipsy Corner and manhole No. 97 the plaintiff should proceed by open trench work instead of tunnel work, that additional land was necessary for such work on either side of the proposed line of sewer, that the defendants neglected to procure him possession of such land, and he was prevented from completing the said line of sewers. On November 14, 1889, the defendants informed the plaintiff that they had given their engineer instructions to make arrangements for the construction of the works by another contractor.

Mr. Justice Wills, in delivering a lengthy judgment for the defendants, said that the plaintiff wished to get out of the expensive part of the contract, not having sufficient pumping power, and the defendants were within their rights in taking the work out of his hands. With regard to the sewer under Mr. Poupart's land, the engineer was within his rights in ordering it to be tunnelled, and Mr. Poupart's consent was not necessary, because the plaintiff could have proceeded by giving a notice under the Public Health Act. He was of opinion that the plaintiff had no intention of performing that part of the contract. Sir Douglas Fox had read his judgment and concurred in it.

CAPITAL AND LABOUR.

NOTTINGHAM MASTER BUILDERS' ASSOCIATION.—A largely-attended meeting of this Association was held at the Mechanics' Institution on the 13th inst., Mr. J. W. Woodsend presiding. In the annual report the Committee expressed regret that the year just passed had been one marked by general slackness of trade; and the difficulties connected therewith had been further increased by the demands of the operatives for higher wages. The latter gave considerable trouble to the Committee, but ultimately a compromise was effected, and an amicable settlement arrived at. The Committee stated that they had under consideration the revision of the schedule of day-work prices, and they recommended that the general contract form sanctioned by the Royal Institute of British Architects should in future be the only approved basis of contracts for the district. A copy of this document has been handed to each member. The number of members is steadily increasing. The report and statement of accounts were adopted.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Board School	Gt. Clacton Sch. Bd.	20 & 10 guineas	Feb. 8
*Lunatic Asylum, Cheddleton	Staffordshire C. C.	200*l.* 150*l.* & 100*l.*	May 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Retorts, Firebricks, &c.	Sowerby Bridge L. B.	J. Marsland	Jan. 24
Roadmaking, Paving, &c.	.....	Walker & Duncan	do.
Additions, Alterations, &c. North Park, Halifax	.....	G. Buckley & Sons	do.
Supply and Fixing of Warming Apparatus	Handsworth Sch. Bd.	J. R. Nichols	do.
Brick Paving Works	Southampton Corp.	W. B. G. Bennett	do.
Street Improvements, Greenfield, Hamilton, N.B.	.....	Robertson & Laird	do.
*Retaining and Boundary Walls	Sheffield U. Gas. Light Co.	F. W. Stevenson	do.
*Grain Warehouse	Preston Corporation	*Official*	do.
*Sewers	Lewisham Bd. of Wks.	do.	do.
*Coast Guard Station, St. Agnes	Admiralty	do.	do.
Tar Paving, Road Metal, &c.	Wandsworth B. of W.	do.	do.
Iron Tanks, Girders, &c. Carmarthen	Asylums Committee	.....	Jan. 25
Sewerage Works, Tanks, &c. Greenock	Renfrew C. C.	J. Barr	do.
Alterations to Baths	Southampton Corp.	W. B. G. Bennett	do.
Wrought-iron Fencing	do.	do.	do.
Four Houses, Hoyland, Barnsley	Herbert Pink	W. J. Sykes	do.
Forming, Sewering, Paving, &c.	Stockport Corp.	J. Atkinson	do.
Reconstruction of Sewers, &c.	Cardiff Corporation	W. Harpur	do.
Entrance Lodge, &c. Ridge End	Burnley Corporation	F. S. Button	do.
Kerbing, Channelling, &c. Chorlton	Plumstead Bd. of Wks	J. Rowland	do.
Kennels, Cottage, &c. Aberdeen	Durris Estate	J. Braid	do.
*Granite Spalls	Hackney Bd. of Wks.	J. Lovegrove	do.
Dwelling-houses, Crofts, Elgin, N.B.	.....	C. C. Doig	do.
*Fifty Houses, Leeds	North Eastern Railway	W. Bell	do.
*Works and Materials	Hampstead Vestry	*Official*	do.
Sewers (2,800 yds.)	Swansea Town Council	.....	Jan. 26
Levelling, Sewering, Forming, Flagging, &c.	Levenshulme (Lancs.) Local Board	J. H. Maybury	do.
Granite Setts, Kerbstones, &c.	Chelsea Vestry	T. W. E. Higgins	do.
Church, &c. Strichen, Aberdeen	Free Church Commrs.	D. M'Millan	do.
Hotel, Miskin, Wales	.....	T. Roderick	Jan. 27
Construction and Erection of Iron Roofs, Columns, &c.	Leicester Corp.	E. G. Mawbey	do.
Supply and Fixing of Oil Cisterns, Dublin	Com. of Irish Light-houses	*Official*	do.
Dwelling-house, Stables, &c. Godley-road, Halifax	.....	Raymond Berry	Jan 28
Farmhouse, Garrigill, Alston	.....	Webster, Son, & Banks	do.
Public Baths and other Works, Cobden-road	Brighton Town Coun.	F. J. C. May	do.
Vicarage, Haslingden, Grane, Lancs.	.....	H. Fielding	do.
Technical School Buildings, King's Lynn	The Committee	.....	do.
Road Metal	Elgin Town Council	*Official*	do.
Improvements, Blackfriars-road, Elgin, N.B.	do.	do.	do.
Walls, Manchester-road	Bury & Dist. Textile Operatives Assoc.	D. Hardman	Jan. 30
*Fittings and Furniture for New Library	Southampton Library Committee	A. E. J. Guy	do.
Chapels, and Alterations and Additions to other Buildings, Maryborough (Ireland) Lunatic Asylum	The Commissioners	Thomas Drew	do.
*Additions and Alterations to Workhouse	Whitechapel Union	Bruce J. Capell	do.
Schoolmaster's Residence, near Abercorn	Mynyddislwyn Sch. B.	George Rosser	do.
Additions to School Buildings, Barncoose	Illogan (Cornwall) Sch. Board	Sampson Hill	do.
Fencing and Gates, Stafford	Householders' Com.	.....	do.
Additions, &c. to School Buildings, Boulton-road	Handsworth Sch. Bd.	J. R. Nichols	Jan. 31

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Supply of Stone, Broken Granite, &c.	Dover Town Council.	*Official*	Jan. 31
School Buildings, &c. Pwllgwaum, Pontypridd	Llantrisant Sch. Bd.	J. J. Evans	do.
Sewers, Flushing Tanks, &c.	Dartmouth Town Coun.	T. O. Veale	do.
*Making-up and Paving Roads	Fulham Vestry	W. Sykes	Feb. 1
*Roadmaking and Paving Works	Greenwich Bd. of Wks	*Official*	do.
*Depositing Soil on Well-street Common	LondonCountyCouncil	do.	do.
*Supply of Stone and Oil	Bexley Local Board	E. Reeve Boulter	do.
Ballast, Lime, &c.	Vestry of St. James, Westminster	*Official*	Feb. 2
*Works and Materials	St. Marylebone Vestry	do.	Feb. 3
*Supply of Stone	do.	do.	do.
*Broken Granite	Norfolk County Council	T. H. B. Heslop	Feb. 4
*Girder Bridge over River Sheaf	Sheffield Impt. Com.	C. F. Wike	do.
Waterworks, Eberstadt (Hessen), Germany	Town Council	*Official*	Feb. 6
Fireclay, Retorts, Bricks, &c.	Widnes Corporation	do.	do.
Gasholder Tanks, &c.	Portadown (Ireland) Gas Company	do.	do.
*Fire Brigade Station, Rotherhithe	LondonCountyCouncil	do.	Feb. 7
Railway Work, Mont de Marsan	Landes Prefecture	do.	Feb. 8
Enlargement of Chapel, Treharris, Glam.	The Committee	.....	do.
Subway and Road Diversion, Stockton	North Eastern Railway	W. J. Cudworth	do.
Railway Construction (Clydebank Contract)	Lanarkshire & Dumbartonshire Ry. Co.	Formans & McCall	Feb. 9
Brick and Pipe Sewer, &c. (3,054 yds.)	Dundalk U.S.A.	J. Gaskin	Feb. 13
Construction of Town Waterworks	Tipperary Union	Strype & Comber	Feb. 14
*Intercepting Sewers	Manchester Corp.	J. Allison	do.
Construction, Alterations, &c. of Sewers	Portsmouth U.S.A.	.....	Feb. 21
*Ironwork, Hydraulic Machinery, Mooring Appliances, &c. for Extension of Ship Wharf	Karachi (India) Port Trustees	Edward Jackson	Feb. 24
*Warming Asylum, Sligo	Governors	*Official*	Mar. 1
Five Shops, Accrington	Trustees of F. Greenhalgh	Haywood & Harrison	No date
Re-building Furniture Repository	A. T. Osborne	J. W. Start	do.
One Hundred and Ten Cottages, Harpurhay, Manchester	.....	J. H. Pemberton	do.
Road Metal, &c.	Motherwell T. C.	*Official*	do.
Fencing, &c. Shipcote, Durham	1st Durham Volunteers	Kempson & Bradshaw	do.
Sinking a Shaft, Ambler Thorn, Halifax	S. Parkinson	.....	do.
Eight Houses, Morley, Yorks	George Johnson	.....	do.
Fencing (17,000 yds.), Leeds	Gledhow Allotment Association	.....	do.
Residence, Broadway, Peterborough	J. H. Duddington	M. Hall	do.
Fixing Wrought and Cast-iron Work, Blackpool	W. A. Peters & Sons	.....	do.
Excavating, &c. Bradford	.....	Ogden & Moore	do.
Enlargement of Church and Schools, Easington-lane, Durham	.....	Davidson & Bendle	do.
Store Premises, Whitehall-road	Gateshead Indus. Co-op. Soc. Lim.	E. Bowman	do.
Re-building "Rose, Shamrock, and Thistle" Inn, &c. Burslem	.....	A. R. Wood	do.
Four Houses, Mount Pleasant, Gateshead	.....	Kempson & Bradshaw	do.
Pulling-down Octagon Tower, King's Cross, Halifax	.....	W. H. D. Horsfall	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Manager of Sewerage Works	Teddington Loc. Bd.	2*l.* weekly, &c.	Jan. 23
Clerk of Works	Barnsley U.R.S.A.	2*l.* per week	Jan. 24
Electrical Engineer	Halifax Corporation	200*l.* per annum	Jan. 26
Surveyor	Castleford Local Bd.	120*l.* per annum	do.
*Road Inspector	Bournemouth T. C.	100*l.* &c.	Jan. 27
Road Surveyor	Horsham Highway Bd.	150*l.* per annum, &c.	Feb. 6
*Civil Engineer, St. John's, Newfoundland	The Municipal Council	.....	April 1
Draughtsman	Sheffield Bd. of Health	120*l.* per annum	No date

Those marked with an Asterisk (*) are advertised in this number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xviii.

Mr. J. W. Woodsend was elected President for the ensuing year, and Mr. George Fish vice-president, with the following gentlemen as members of the Committee:—Messrs. J. J. Adams, J. Cooper, T. Cuthbert, C. Dennett, H. C. Gilbert, Enoch Hind, Joseph Hodson, F. Messom, R. Simpson, Councillor J. Wright, James Wright, and F. Wartnaby. Votes of thanks were given to the retiring officers for their services, and to the chairman for presiding.

MEETINGS.

MONDAY, JANUARY 23.

Royal Academy of Arts.—Professor Aitchison, A.R.A., will deliver his First Lecture for Session 1892-93: Subject, "What is Architecture, and how can it be Advanced?" 8 p.m.

Surveyors' Institution.—Discussion on Mr. P. D. Tuckett's paper on "The Proposed Bimetallism as affecting British Interests," and on Mr. A. Goddard's paper on "The Currency Question and Land." 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. T. S. Watney on "Electric Lighting." 7.30 p.m.

TUESDAY, JANUARY 24.

Society of Arts (Applied Art Section).—Mr. Hugh Stannus, F.R.I.B.A., on "The Theory of 'Storiation' in Art." 8 p.m.

Institution of Civil Engineers.—Further discussion on Mr. J. Emerson Dowson's paper on "Gas-Power for Electric Lighting." 8 p.m.

Glasgow Architectural Association.—Mr. J. J. Burnet on "The Architect and his Assistant."

WEDNESDAY, JANUARY 25.

Society of Arts.—Mr. Wyke Bayliss, F.S.A., on "The Fine Arts in Relation to the Sanitary Condition of our Great Cities." 8 p.m.

Institute of Builders.—Mr. W. Shepherd on "Building and Engineering Works for Public Authorities." 7 p.m.

Liverpool Engineering Society.—Mr. J. F. Conradi on "Petroleum Engines." 8 p.m.

THURSDAY, JANUARY 26.

Royal Academy of Arts.—Professor Aitchison, A.R.A., will deliver his Second Lecture for Session 1892-93: Subject, "What is Architecture, and how can it be Advanced?" 8 p.m.

Institution of Electrical Engineers.—The President, Mr. W. H. Preece, F.R.S., will deliver his Inaugural Address. 8 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, JANUARY 27.

Architectural Association.—Mr. Sydney Vacher on "The Small Suburban House." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. A. S. Butterworth on "The Disposal of Town Refuse by Burning, and the Application of the Heat thereby Generated." 7.30 p.m.

Society of Arts (Howard Lectures).—Professor W. C. Unwin on "The Development and Transmission of Power from Central Stations." III. 8 p.m.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

50.—ARTIFICIAL MARBLE: *P. A. Moreau.*—This invention relates to improvements in the manufacture of artificial marble, and consists in the working and "sculpting," while soft, of porous stones in such a manner as to bring them to the desired form of the object to be fashioned, and then to "transform" the stones so formed into marble. This is effected in two operations, the one being the application to the stone of coloured stains of varied colours and appearance, and which penetrate the stone, the other the hardening of the stones so coloured by soaking in a metallic bath.

6,804.—PORTABLE SCAFFOLD: *G. Ayling.*—This specification refers to an improved portable scaffold to be used by decorators and others. The inventor employs two pairs of detachable legs, or standard, and upon each pair is arranged a sliding frame adapted to be adjusted in any desired position upon the legs, and to the height of the scaffold, and to support the plank or planks of the same. These planks, when in use, are connected to the supporting frames by means of hinges, or joints, and the end supports and planks are retained in their proper relative position by struts connected to the frames and to the planks.

13,232.—WATER CLOSETS: *E. Baumgartel.*—This patent refers to an improved water seal for hermetically closing water-closet basins, distinguishable in the first place by its arrangement at the upper edge of the basin, besides offering the advantage of reducing the consumption of water. The basin is provided at its upper end with a groove, which may be situated either within the basin or on its outside, or along the upper surface of the edge of the basin. Into the groove fits the downwardly projecting vertical rib or flange of the lid. The groove is kept constantly filled with water, and for this purpose an arrangement is adopted, based on the same principle as the existing trap. The groove is connected with a second basin, to which leads a pipe extending from a tank, which, on being filled, is tightly closed. In proportion as the water level sinks, a fresh supply is admitted through the pipe, so that the water-level always remains practically constant in the groove.

17,014.—WATER CLOSETS: *J. Reekie.*—This invention relates to the fixing of that kind of water closet known as the "wash-down" closet, and it is based upon the employment of a stand or pedestal consisting of a segment of a cylinder with a flange at the bottom turned outwards, and a socket at the top, made of cast-iron or other suitable material. Instead of a segment and flange, two or three legs may be employed.

17,016.—DRAIN TESTING: *J. Jones and another.*—This patent relates to apparatus for testing drains, and is also applicable for disinfecting and other purposes. It consists in the combination with a removable box, having a permanently fixed grated bottom and a removable grate, of a clock-work operated fan, and of a flexible pipe, nozzle, and inflatable air collar. In employing the apparatus for testing, cotton waste is preferably used, prepared in such a manner as to ensure its smouldering without bursting into flame, and as to impart to the smoke a distinctive smell.

17,319.—DOOR STOP: *C. H. Timms.*—This invention relates to a combined door stop and holder, or retainer, and among other things has for its object to provide a stop which may be adjusted for any angle, to provide a gravitating latch, automatic in operation, to catch and hold the door when opened to its fullest extent, and to so adapt the latch that it may be thrown into a position, so that the stop may be used irrespective of the catch or holder when desired. It comprises a bracket to be secured to the base or sill-board of a room, a stop, and a pivot bolt and set-nut for adjustably connecting the stop to the bracket; the stop being also provided on its upper side with flanges, having corresponding longitudinal slots provided with an offset at their forward ends, and the sliding gravitating latch having a pivot-stud or lug projecting from opposite sides, and arranged to play in the slots and offsets thereof.

NEW APPLICATIONS FOR LETTERS PATENT.

January 2.—12, J. Shanks, Domestic Water Supply Apparatus.—20, G. Bray, Lighting and Ventilating Rooms.—29, E. Garbett, Construction of Incombustible Stairs, Floors, and Roofs.—67, F. Ryland, Sash Pulleys, &c.

January 3.—96, H. Champness, Construction and Use of Certain Portions of Fittings, as used in Bakers' Ovens.—99, L. Grimshaw, Adjustable Opener for Windows, Fanlights, &c.—104, J. Johnson, Step Ladders.—131, H. Gore, Clamp for Fixing Mantel-boards, &c.

January 4.—157, S. Williams and G. Wood, Flooring in Iron and Steel.—160, W. Brierley, Chimney Tops.—189, F. Hitchnough, Sashes and Window Frames.

January 5.—249, M. Fawcett and others, Fireproof Floors.—255, A. Yates and others, Closets.—265, F. Martin, Chimney Pot.

January 6.—314, C. Jackson, Fanlight Opener.

January 7.—341, A. Calmour, Window Frame Fastening.—346, A. Morrison, Securing Door Knobs or Handles to Spindles.—349, P. Mooney, Flushing Cisterns, &c., for Water Closets, Urinals, &c.—352, W. Oates and others, Gully Traps.—353, W. Oates and J. Green, Square-top Gully Traps.—354, F. Berry, Bricks or Blocks for Building Purposes.—395, G. Ayling, Step Ladders.—357, W. Taylor, Ventilator or Chimney Cowl.—364, J. Merrill, Flushing of Water Closets.

PROVISIONAL SPECIFICATIONS ACCEPTED.

20,501, H. Leah, Siphon Cisterns.—22,204, J. Inwood, Ventilation of Windows, without draught.—22,257, C. Brendenberg, Paint and other Brushes.—22,389, T. Hall, Automatic Sash Fastener.—22,392, F. Sara, Flushing Cisterns.—22,476, The Bostwick Gate and Shutter Co., Lift Gates.—22,488, J. Merrill, Lavatories and Wash Basins.—22,511, C. Burrows, Retaining Fastenings, for open doors.—22,614, T. Brogan, Automatic Traps, for Waste Pipes.—22,640, C. Doriot, Water Closets.—22,666, J. Morley, Connecting Ends of Pipes.—22,721, C. Darrah, Connecting Metal Pipes to Earthenware Closets.—22,738, D. Andrew, Sewer and other Pipes.—22,754, A. Burton, Window Fastenings.—22,802, W. Wibberley, Preventing the Slipping and Rattling of Window and similar Sashes.—23,102, J. Maskelyne, Coin Freed Locks for Water Closet Doors.—23,354, T. Holmes and R. Williams, Pipe Joint or Coupling.—23,355, H. Symington, Pipe Couplings.—23,359, T. and R. Lees, Circular Moulding Machines for Wood Working.—23,541, H. Greenwood, Machinery or Apparatus for Dovetailing in Wood.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

20, J. Bennett, Ventilation of Sewers and Drains.—1,839, G. Paley, Water Closet Cisterns.—4,280, R. Hocking, Water Closets.—4,373, T. Walford and J. Hodgkins, Caps or Terminals for Chimneys.—6,104, C. Luther, Cement or Glue for Joining Wood.—22,439, J. Thompson, Traps for Gullies, &c.—22,465; A. Boult, Malting Floors.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JANUARY 6.—By *A. Robertson*: I.g.r.'s of 85*l.*, Brixton-rd., u.t. 95 yrs., g.r. 58*l.*, 614*l.*; f.g.r.'s of 56*l.*, East Surrey-gr., Peckham, with reversion in 69 yrs., 1,430*l.*; ditto, f.g.r.'s of 56*l.*, with ditto in 71 yrs., 1,420*l.*; f.g.r. of 28*l.*, New Kent-rd., with reversion in 79 yrs., 500*l.*

JANUARY 10.—By *Rogers, Chapman, & Thomas*: I.g.r. of 22*l.*, St. George's-sq., Belgravia, u.t. 44 yrs., g.r. 1*l.*, with short reversion, 455*l.*; i.g.r. of 125*l.*, Clanricarde-gdns., Kensington, u.t. 74 yrs., g.r. 15*l.*, with short reversion, 2,270*l.*; i.g.r. of 30*l.*, Cunningham-pl., Maida-vale, u.t. 30 yrs., g.r. 15*l.*, 230*l.*; 51, Gloucester-st., Pimlico, u.t. 38 yrs., g.r. 9*l.*, 565*l.*—By *Cane & Co.*: 55 to 63 (odd), Northcross-rd., Dulwich, u.t. 74 yrs., g.r. 17*l.* 10s., r. 160*l.*, 1,400*l.*

JANUARY 11.—By *G. A. Wilkinson & Son*: 80 and 82, Sclater-st., Bethnal Green, f.r. 71*l.* 12s., 1,360*l.*; 90 and 91, Sclater-st., f.r. 104*l.*, 1,540*l.*; 97 and 99, Sclater-st., f.r., 104*l.*, 1,385*l.*; 74 to 88 (even), Hare-st., u.t. 19 yrs., g.r. 25*l.*, 250*l.*; 9, 13, 15 and 17, Grey Eagle-st., Spitalfields, u.t. 2 yrs., g.r., 35*l.*, 60*l.*; 8 and 9, Gun-st., f.r. 40*l.*, 765*l.*; 27, Gun-st., f.r. 40*l.*, 600*l.*; 20, Weymouth-ter., Hackney-road, f.r., 30*l.*, 470*l.*; 18 to 26 (even), The Portway, West Ham, f., 880*l.*; 28 to 40 (even), The Portway, f., 1,220*l.*; 1, 3 and 5, Gift-lane, f., 220*l.*; a plot of f. land, in rear of above, 235*l.*; 2 to 14 (even), Caroline-pl., and 2, 4, 6, 16 and 18, Gift-lane, area 1a. 19p., f., 1,040*l.*; 20, 24, 26 and 28, Church-st., f., 575*l.*

JANUARY 12.—By *Belton & Sons*: "The Vine" Public House, Highgate-rd., Kentish Town, c., r. 100*l.*, 4,000*l.*—By *Field & Sons*: "The Innocuous White Lead Factory," Hatcham-rd., Old Kent-rd., u.t. 50 yrs., g.r. 26*l.*, r. 120*l.*, 990*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground rent; i.g.r. for improved ground-rent; g.r. for ground rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.	ton	9/0/0 0/0/0
Teak, E.I.	load	9/10/0 15/0/0
Sequoia, U.S.ft cu.		2/3 2/6
Ash, Canada	load	2/10/0 4/0/0
Birch, do.		3/5/0 4/10/0
Elm, do.		3/10/0 4/15/0
Fir, Dantsic, &c.		1/10/0 3/10/0
Oak, do.		3/0/0 5/5/0
Canada		5/10/0 7/0/0
Pine, Canada	red	2/10/0 3/10/0
Do.	Yellow	2/10/0 5/0/0
Lath, D'ntsic, fath		5/0/0 6/0/0
St. Petersburg		5/0/0 7/0/0
eals, Finland		
2nd & 1st std		7/10/0 10/0/0
Do. 4th & 3rd		7/10/0 8/0/0
Do. Riga		6/10/0 8/0/0
St. Petersburg,		
1st yellow		10/10/0 14/10/0
Do. 2nd yellow		8/10/0 9/10/0
Do. white		7/10/0 9/10/0
Swedish		7/10/0 16/0/0
White Sea		8/10/0 17/0/0
Canada, Pine 1st		21/0/0 27/10/0
Do. do. 2nd		15/0/0 17/0/0
Do. do. 3rd &c.		7/10/0 10/0/0
Do. Spruce, 1st		8/10/0 11/0/0
Do. do. 3rd & 2nd		6/10/0 8/0/0
New Brunswick		6/10/0 7/10/0
Battens, all kinds		3/10/0 15/10/0
Flooring boards, sq., 1 in. prep.		0/8/0 0/14/0
Do. 2nd		0/7/0 0/10/0
Other qualities		0/3/6 0/7/6
Cedar, Cuba ..ft.		3½ 4½
Honduras, ..&c		3½ 4½
Mahogany, Cuba		3½ 4½
St. Domingo, cargo av.		4½ 6½
Mexican do. do.		4 2/0
Tobasco do. do.		4 5
Honduras do.		4½ 7
Box, Turkey ton		5 6¼
Rose, Rio		4/0/0 13/0/0
Bahia		10/0/0 20/0/0
Satin, St. Domingo		9/0/0 18/0/0
Porto Rico	ft.	0/0/6 0/1/3
		0/0/7 0/1/6

TIMBER (*continued*).

Walnut, Italian ..		0/0/3½ 0/0/7

METALS.

Iron—Pig, in Scotland	ton	2/3/5 0/0/0
Bar, Welsh, in London		5/17/6 6/0/0
Do. do. at works in Wales		5/7/6 5/10/0
Do. Staffordshire, in London		6/0/0 6/10/0
COPPER—British, cake and ingot		49/0/0 49/10/0
Best selected		50/0/0 51/0/0
Sheets, strong		59/0/0 0/0/0
Chili, bars		46/0/0 46/7/6
YELLOWMETALlb		0/0/5½ 0/0/5¾
LEAD—Pig, Spanish	ton	9/16/3 9/17/6
English com. brands		10/0/0 0/0/0
Sheet, English, 6 lbs. per sq. ft. and upwards		11/5/0 0/0/0
Pipe		11/15/0 0/0/0
ZINC—English sheet	ton	22/0/0 0/0/0
Vieille Montagne		22/10/0 0/0/0
TIN—Straits		92/5/0 92/15/0
Australian		92/10/0 93/0/0
English Ingots		94/10/0 95/0/0
Banca		92/5/0 92/10/0
Billiton		92/5/0 92/10/0

OILS.

Linseed	ton	18/17/6 19/0/0
Cocoanut, Cochin		26/0/0 0/0/0
Do. Ceylon		24/10/0 25/0/0
Palm, Lagos		26/10/0 27/0/0
Rapeseed, English pale		24/0/0 25/5/0
Do. brown		23/10/0 0/0/0
Cottonseed ref.		20/0/0 0/0/0
Oleine		20/10/0 21/0/0
Lubricating, U.S.		4/0/0 5/0/0
Do. refined		5/10/0 12/0/0
TAR—Stockholm	barrel	0/17/6 0/18/6
Archangel		0/12/6 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 12 noon on Thursdays.*]

ALDERSHOT.—For Petty Sessions rooms and alterations to police station for the Hampshire County Council. Mr. James Robinson, County Architect, 13, Southgate-street, Winchester:—

G. Kemp	£2,392
Simonds Bros.	2,662
J. H. Corke, Southsea*	£2,550

* Accepted.

BARNSLEY.—For the laying of about 10,836 yds. of cast-iron pipes, sluice valves, hydrants, &c., for the Rural Sanitary Authority. Mr. Joseph Latham, Engineer, 114, Dogworth-road, Barnsley. Quantities by the Engineer:—

George Hall	£932 19 10
Hutchinson Bros.	913 4 2
Allen Beaumont	898 0 0
Riley & Robinson	888 6 11½
Charles Green	870 0 0
Rogers & Squires	831 18 0
G. Taylor	823 5 6
Brookman	813 6 8
	775 7 6

[Surveyor's estimate, £646 10 8.]

BRISTOL.—For laying a pipe sewer and making new road at Whitehall St. George, for Mr. J. A. Allen, Mr. W. Holbrow, surveyor, John-street, Bristol:—

William Allen	£370
Turner	347
G. Roberts (accepted)	£200

BROMLEY (Kent).—For sewering, levelling, paving, &c., Hope Park, for the Local Board. Mr. Hawkings, Surveyor, Local Board Offices, Bromley, Kent:—

Thos. Lansbury	£547 1 7
Woodham, Fry, & Fry	525 10 3
John Mowlem & Co., Westminster (accepted)	£490

CLACTON-ON-SEA.—For new Town-hall Buildings. Mr. J. Wallis Chapman, architect, 11, Sutherland-avenue, W.:—

Geo. Dobson	£10,312	S. & W. Pattinson	£9,223
Andrews & Sons	10,114	H. Dover Wood..	9,113
Kirk & Randall	9,612	Ernest West	8,800
E. Buckingham & Son	9,554	C. Orfeur	8,690
J. P. Groome	9,500	Neave & Neave	8,530
Ellis & Turner	9,500	Everett & Son, Colchester*	8,473
Wm. Dabbs	9,425		

* Accepted.

CROYDON.—For road-works, Werndee-road, and portions of Balfour, Crowther, and Stanger roads, South Norwood, for the Corporation. Mr. W. Powell, Borough Surveyor, 8, Katharine-street, Croydon. Quantities by W. Powell:—

Werndee-road.

Alfred Bullock	£276 10 3	Henry Lake, Princess-road, Croydon*	£274 1 3

Balfour-road.

Alfred Bullock	£281 16 4	Henry Lake*	£280 0 11

Stanger-road.

Alfred Bullock	£88 12 6	Henry Lake*	£86 12 7

Crowther-road.

Henry Lake	£344 10 3	Alfred Bullock, Tanfield-road, Croydon*	£338 12 3

* Accepted.

EAST GRINSTEAD.—For the construction of sewers and formation of roads, Portland Estate, for the Portland Estate Syndicate. Messrs. J. D. & H. E. Mathews, architects, 11, Dowgate-hill, E.C.:—

	For roads.	For fences.
J. Dickson	£1,965 0 0	£105 0 0
Barlow & Roberts	1,875 0 0	57 0 0
S. Kavanagh	1,756 15 10	50 0 0
J. L. Cattell	1,693 0 0	112 0 0
J. R. Hunt	1,548 0 0	85 0 0
W. H. Holman & Co.	1,471 0 0	33 0 0
W. H. Wheeler	1,294 0 0	60 0 0
J. G. Pickard	1,273 0 0	57 5 10
W. H. Steer	1,145 0 0	28 0 0
E. Steer	1,135 0 0	24 10 0
M. S. Kitteringham	1,099 0 6	40 0 0
W. Jenner, Sutton, Surrey*	997 0 0	55 0 0
	911 0 0	7s. per rod.

*Accepted.

FORRES (N.B.).—Accepted for the erection of a house and shop. Mr. William Mackintosh, architect, 16 Union-street, Inverness:—

Mason.—David Ross, Forres.
Carpenter.—Alexander Laing, Forres.
Slater.—Alexander Forbes, Forres.
Plumber.—R. H. D. Forsyth, Forres.
Plasterers.—J. & L. Hay, Grantown.
Painter.—Arch. McDonald, Forres.
Blacksmiths.—Rose Foundry Co., Inverness.

Total—£686 9 6

HORNSEY.—For the construction of stoneware pipe sewers (3,920 ft. of 12 in., 540 ft. of 15 in., and 8,000 ft. of 6 in. pipe), &c., Rathcoole Estate, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer, Local Board Offices, Southwood-lane, Highgate:—

Thomas Adams	£2,294 18 3	T. G. Dunmore, Crouch End*	£2,180 0 0
B. Cooke & Co.	2,251 0 0	J. Bentley	2,114 0 0
H. Drury	2,244 18 7		

* Accepted.

HORNSEY.—For sewering, metalling, paving, and roads for the Hornsey Local Board. Mr. T. de Courcy Meade, C.E., Surveyor, Local Board Offices, Southwood-lane, Highgate:—

North Hill-avenue.

Cooke & Co., B.	£461 0 0	Adams, Thomas, Wood Green*	£433 5 6
Griffiths, Wm.	443 2 6		

* Accepted.

Claremont-road (3rd Section).

Cooke & Co., B.	£711 0 0	Adams, Thomas, Wood Green*	£652 18 2
Hudson, Sidney	677 1 6		
Griffiths, Wm.	667 4 0		

* Accepted.

Stanhope-road (2nd Section).

Cooke & Co., B.	£2,057 0 0	Adams, Thomas, Wood Green*	£1,948 7 6
Griffiths, Wm.	2,054 18 3		
Hudson, Sidney	1,963 9 8		

* Accepted.

Nelson-road (2nd Section).

Cooke, B., & Co.	£3,132 0 0	Adams, Thomas, Wood Green*	£2,715 7 4
Griffiths, Wm.	3,003 15 1		

* Accepted.

KENDAL.—For the laying out and forming of a new street, with drains, &c., the Lownd, for the Kendal Co-operative Society. Mr. John Hutton, architect, Kendal. Quantities by the architect:—

B. Lazenby	£596 14 5	T. & W. Dirkin, Waterside, Kendal*	£300 0 0
Edw. Hine	590 10 5		
James Tallon	578 0 0	S. Carradus & Son	369 0 0
Robert Craig	408 12 7		

* Accepted

KEYHAM (Leicestershire).—For additions to Glebe Farmhouse. Messrs. Mills & Beasley, architects, Leicester. Quantities by architects:—

W. Starkie	£191 10 0	F. Sleath, Rothley*	£157 17 8
M. Hickling	175 10 0		

*Accepted.

LLANDRINDOD WELLS (Radnorshire).—For the erection of a house for Miss M. A. J. Sheen. Mr. W. Scott-Deakin, architect, Shrewsbury:—

J. D. Williams	£2,365	Robert Davies, Llandrindod (accepted)	£1,800
W. Bowers & Co.	2,225		
Hugh Pritchard	2,050	S. W. Deakins	1,785

LONDON.—For re-building Nos. 4 and 5, Little Queen-street, Westminster. Messrs. T. Chatfeild Clarke & Son, architects, 63, Bishopsgate-street Within:—

C. Cox	£2,975	E. Lawrance & Sons	£2,59
Brown, Son, & Blomfield	2,790	B. E. Nightingale	2,543
J. Smith, & Sons	2,730	Clarke & Bracey	2,529
J. Tyerman	2,729	McCormick & Sons	2,474
Colls & Sons	2,720	Woodward & Co.	2,459
	2,690	Houghton & Son	2,397

LONDON.—For shops, High-street, Clapham. Messrs. Lawson & Donkin, architects, Bournemouth:—

Norris & Luke	£2,864 0 0	W. H. C. Curtis	£2,429 0 0
Battley, Sons, & Holmes	2,644 0 0	Garrett & Son	2,427 0 0
Reed, Blight, & Co.	2,559 10 0	E. Trigg	2,400 0 0
Stewart & Co.	2,537 8 10	J. H. Jarvis	2,353 0 0
De Vere Buckingham & Co.	2,498 0 0	T. H. Kingerlee	2,345 0 0

LONDON.—For alterations to the "Weymouth Arms" public house, Sayer-street, New Kent-road. Mr. W. M. Brutton, architect, 171, Queen Victoria-street, E.C.:—

Hooper	£1,087	G. S. Archer	£1,000
Pritchard & Renwick	1,065	Edwards & Medway	980
William Smith	1,060	Whitehead & Co., Clapham-road*	910
A. H. Tout	1,050		
Burnham & Sons	1,000		

* Accepted.

LONDON.—For reparations to several houses at Mary Ann-street, Severn-street, Pinchin-street, Shetfield-street, and Philip-street, St. George's-in-the-East, for the Trustees of the Oakley Estate. Mr. Albert E. Pridmore, architect, 2, Broad-street-buildings, E.C.:—

Little & Seneca	£1,425	Thos. Elkington	£840
E. A. Beer	1,400	W. J. Davenport*	570
H. Bradford	1,010		

* Accepted.

LONDON.—For alterations and additional billiard-room to the "Olive Branch," Earl-street, Edgware-road, for Mr. S. Cox. Mr. Bunn, architect, 123, Camden-street, N.W.:—

Godson & Sons	£313
Nye	230

LONDON.—Accepted for rebuilding stables, Devonshire-street, W.:—

N. Lidstone, 96, Blackstock-road, N. £1,284 0 0

LONDON.—Accepted for rebuilding No. 4, St. Martin's-street, Leicester-square, for Mr. Israel Britton. Mr. W. M. Brutton, architect, 171, Queen Victoria-street, E.C.:—

G. S. Archer £882 0 0

LONDON.—Accepted for additions and alterations to the "Shakespeare" Hotel, Kilburn, for Mr. W. S. Jones, Mr. Cox Dear, architect, 117, Great Russell-street, Bloomsbury:—

Milroy £643 0 0

LONDON.—Accepted for additions and alterations to the "Empire" Hotel, 44, 45, and 46, Leicester-square, W., for Mr. Conrad Vonhagen, Mr. Cox Dear, architect, 117, Great Russell-street, Bloomsbury:—

Milroy £620 0 0

LONDON.—Accepted for kerbing and tar-paving footpaths, channelling, &c., Cranston-road, Forest Hill, for the Lewisham Board of Works. Mr. John Carline, Surveyor, Board of Works Offices, Catford, S.E.:—

James Woodham, Lower Sydenham £492 0 0

LONDON.—For new kitchen fittings, hot plate, &c., for the "Cambrian" stores, 44, Glasshouse-street, W. Mr. R. Sawyer, architect, 10, Craig's-court, Charing Cross:—

Davis & Co.	£348 15	W. H. Godden	£277 0
Wilson & Son	331 14	Wilson Engineering Co.	246 10
Sugg & Co.	306 10		

LONDON.—Accepted for reparation to several houses at Mary Ann-street, for the Trustees of the Oakley Estate. Mr. Albert E. Pridmore, architect, 2, Broad-street-buildings, E.C.:—

Thos. Elkington £304 0 0

[No competition.]

LONDON.—Accepted for gas fittings and electric installation at the "Old Crown and Cushion" public house, Westminster Bridge-road, for Mr. W. J. Grimes. Mr. W. M. Brutton, architect, 171, Queen Victoria-street, E.C.:—

William Winn £295 0 0

LONDON.—For sanitary alterations and improvements at No. 12, Leadenhall-street, E.C., for Messrs. D. Sassoon & Co. Mr. Walter J. Ebbetts, architect, Savoy House, 115, Strand, W.C.:—

Bolding & Sons	£160	Geo. Jennings*	£116
Philips & Bisiker	138		

* Accepted.

LOWESTOFT (Suffolk).—For the erection of the Grand Hotel, Kirkley, Lowestoft, for Mr. John Whaley. Mr. Walter Graves, architect, Winchester House, Old Broad-street, London, E.C. Quantities prepared by Mr. George Francis, Princes-road, Buckhurst Hill. (Exclusive of hollow walls):—

Hall, Beddall, & Co.	£15,876	Daws & Son	£13,739
B. E. Nightingale	15,334	Youngs & Son, Norwich (accepted)	13,589
H. Lacey	13,950	Downing & Son*	13,527
O. T. Gibbons	13,750		

* Conditional as to time.

NORTHALLERTON.—For the construction of an outfall sewer of glazed earthenware pipes, &c., for the Local Board. Mr. D. Balfour, engineer, 3, St. Nicholas-buildings, Newcastle-on-Tyne:—

W. Fleming	£675 10 8	Thomas Dixon	£396 0 0
G. Allison	625 0 0	John Carrick	379 11 0
W. Blooman	543 17 0	J. Goldsborough, Chester-le-Street*	325 18 0
J. L. Hampton	444 12 0		
R. Hudson, junr.	400 0 0		

*Accepted.

NORTHAMPTON.—For the alterations, &c., to school buildings Winwick. Mr. J. G. Stallibrass, architect, North-street, Peterborough:—

Howe	£220 0 0	Kidd	£177 10 5
Coates and Son	215 0 0	Bullimore, Great Gidding*	176 7 6
Nichols	205 0 0	Sharpe	175 5 6
Guttridge	200 0 0		
Shepperson	180 0 0		

*Accepted.

NORTHAMPTON.—For alterations and additions to St. Andrew's Hospital. Mr. C. Dorman, architect, 51, Abington-street, Northampton. Quantities by the architect:—

T. Hipwell	£4,017	A. P. Hawlin	£3,698
Sharman Bros.	3,923	Green Bros.	3,593
J. T. Wingrove	3,744	H. Martin, Northampton*	3,585

* Accepted.

PLYMOUTH.—Accepted for excavating pipe trenches, filling in, &c., for the Corporation. Mr. E. Sandeman, Water Engineer Guildhall-buildings, Plymouth:—

C. L. Duke, Cambridge-street, Plymouth .....

SURBITON.—For two villa residences in St. Andrew's-square, Surbiton. Mr. R. Lano Pearce, architect, 100c, Queen Victoria-street, E.C.:—

Jarvis	£1,297 0	A. Brown & Co.	£1,105 10
Coxhead	1,212 0	Martin	1,054 0

TOTLAND BAY (Isle of Wight).—For the construction of a sewerage system, &c., for the Isle of Wight Rural Sanitary Authority. Mr. W. Lidstone, engineer, 12, Victoria-street, Westminster:—

Jas. Dickson	£6,594 0	Burn, Fryer, & Co.	£4,400 0
W. Swales	5,866 0	W. Fortescue	4,391 0
Denham & Jenvey	5,480 0	Osborne McCrea, Southampton*	4,387 14
B. Cooke & Co.	5,300 0		

* Provisionally accepted.

WANSTEAD.—Accepted for the erection of Trumpington-road Schools, for the Wanstead School Board. Mr. John T. Bressey, architect, 70 and 71, Bishopsgate-street, E.C.:—

Alfred Reed & Son, Stratford £12,876 0 0

[For full list see p. 40, *ante*. Messrs. De Vere Buckingham & Co. ask us to say that their tender was withdrawn owing to an error of £752 10s.]

WARRINGTON.—Accepted for the erection and supply of iron-roof, columns, and staying, for the Town Council. Mr. James Deas, engineer:—

Homan & Rodgers, Manchester £492 0 0

WOOLWICH.—For the execution of certain engineering work at the Public Baths, for the Local Board of the parish of Woolwich. Mr. H. H. Church, architect, William-street, Woolwich:—

	A*	B*
John Fraser & Son	£6,942	£5,795
Summerscales & Sons	6,844	5,733
W. J. Fraser & Co.	6,447	5,225
Fraser & Fraser	5,895	4,885
J. D. Berry & Sons	5,820	4,795
H. Young & Co.	5,800	4,760
J. & T. May	5,432	4,600
Jenkins & Son	5,414	4,306
Murdoch & Cameron	5,169	4,215
Rosser & Russell	5,000	3,996
Benham & Sons	4,831	3,944

*Tenders marked A include steam machinery and fittings. Tenders marked B do not include same.

WOOLWICH.—For 1,400 ft. of 15 in. pipe sewer, for waste water from the Public Baths, now in course of erection, for the Local Board of Health. Mr. H. H. Church, architect, William-street, Woolwich:—

Brewer	£680 0	Rackham & Bentham, Plumstead*	£468 2
Girling	600 0		
Brightmore	539 10		

* Accepted.

WOOLWICH. — For rebuilding the "Duke of Wellington" Tavern, William-street, Woolwich, for Mr. J. Prance. Mr. H. H. Church, architect, Woolwich :—

Balaam Brothers	£3,153	Young & Lonsdale	£2,728
Munday & Son	2,900	Chapman	2,505
Chessum & Sons	2,750	Holloway H. L.*	2,470

* Accepted.

WOOLWICH.—For rebuilding No. 60, Powis-street, Woolwich, for Mr. Robert Martin. Mr. H. H. Church, architect, Woolwich :—

Blake	£2,079	Holloway, H. L.	£1,476
Reed & Son	1,625	Tarrant	1,425
Chapman	1,597	Multon & Wallis*	1,339
Chessum & Sons	1,520	*Accepted.	

WOOLWICH.—For show-rooms for Messrs. Birt & Sons, in Russell-place, Greens'-end. Mr. H. H. Church, architect, Woolwich :—

Balaam Brothers	£1,070	Chapman	£985
Holloway, H. L.	1,060	Tarrant	980
Multon & Wallis	1,029	Young & Lonsdale*	892
Chessum & Sons	996	*Accepted.	

WOOLWICH.—For cottage in King-street, for Mr. D. Davis. Mr. H. H. Church, architect, Woolwich :—

H. L. Holloway (accepted) £256

WOOLWICH.—Accepted for additions and alterations to the "Duke of Connaught" Coffee Tavern, New-road. Mr. H. H. Church, architect, Woolwich :—

	Additions.		*Alterations.*
Multon & Wallis	£259 0	Hodgin	£145 10

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1892.

13. ST. PAUL'S	Jan. 2.	19. SOUTHWELL ..	July 2.
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	25. ST. DAVID'S.. ..		Dec. 3.

1893.

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Letters on "London Water Supply," "Orientation of Churches," and "Concrete Floors," held over for want of space.

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We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

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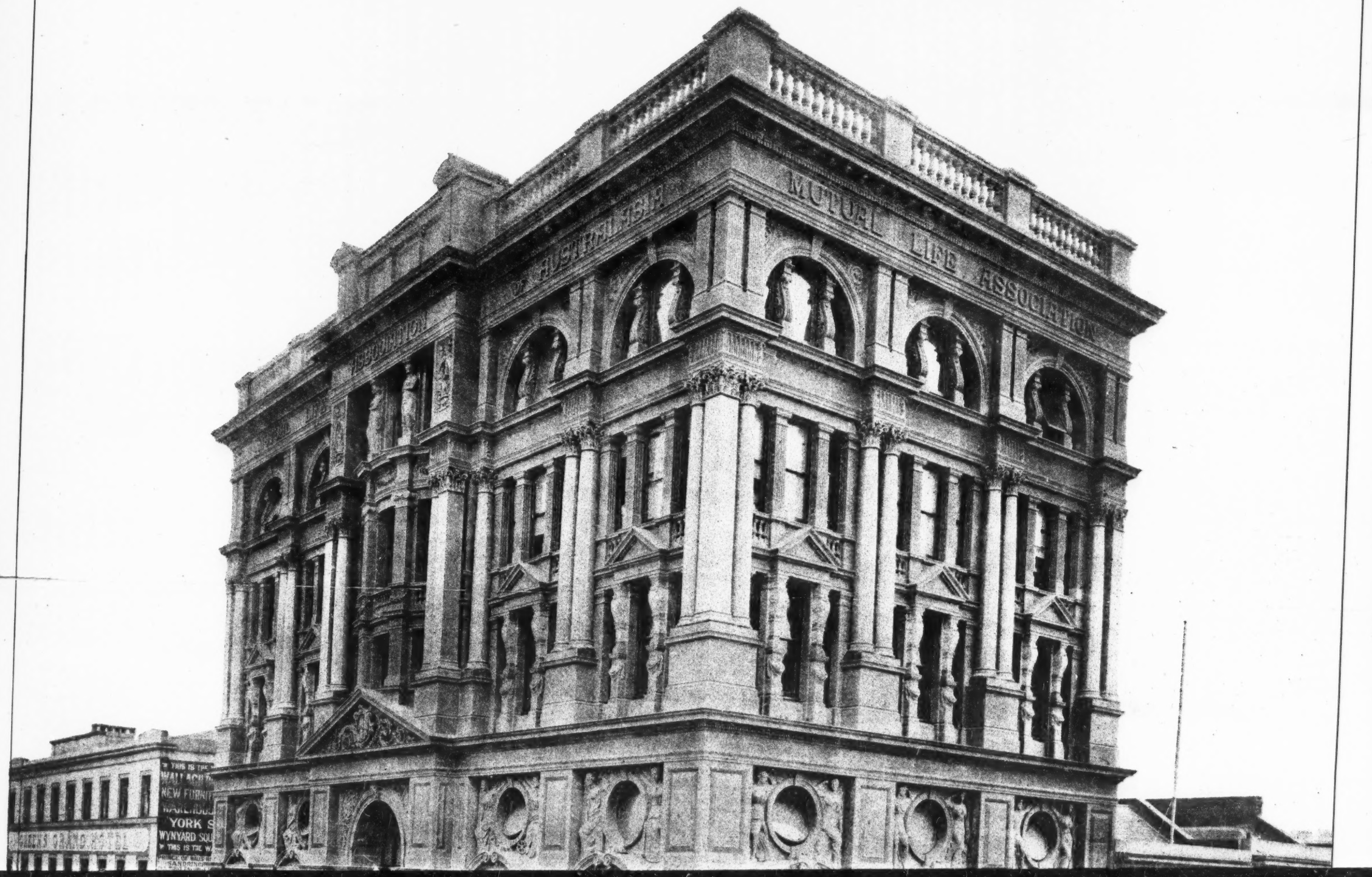
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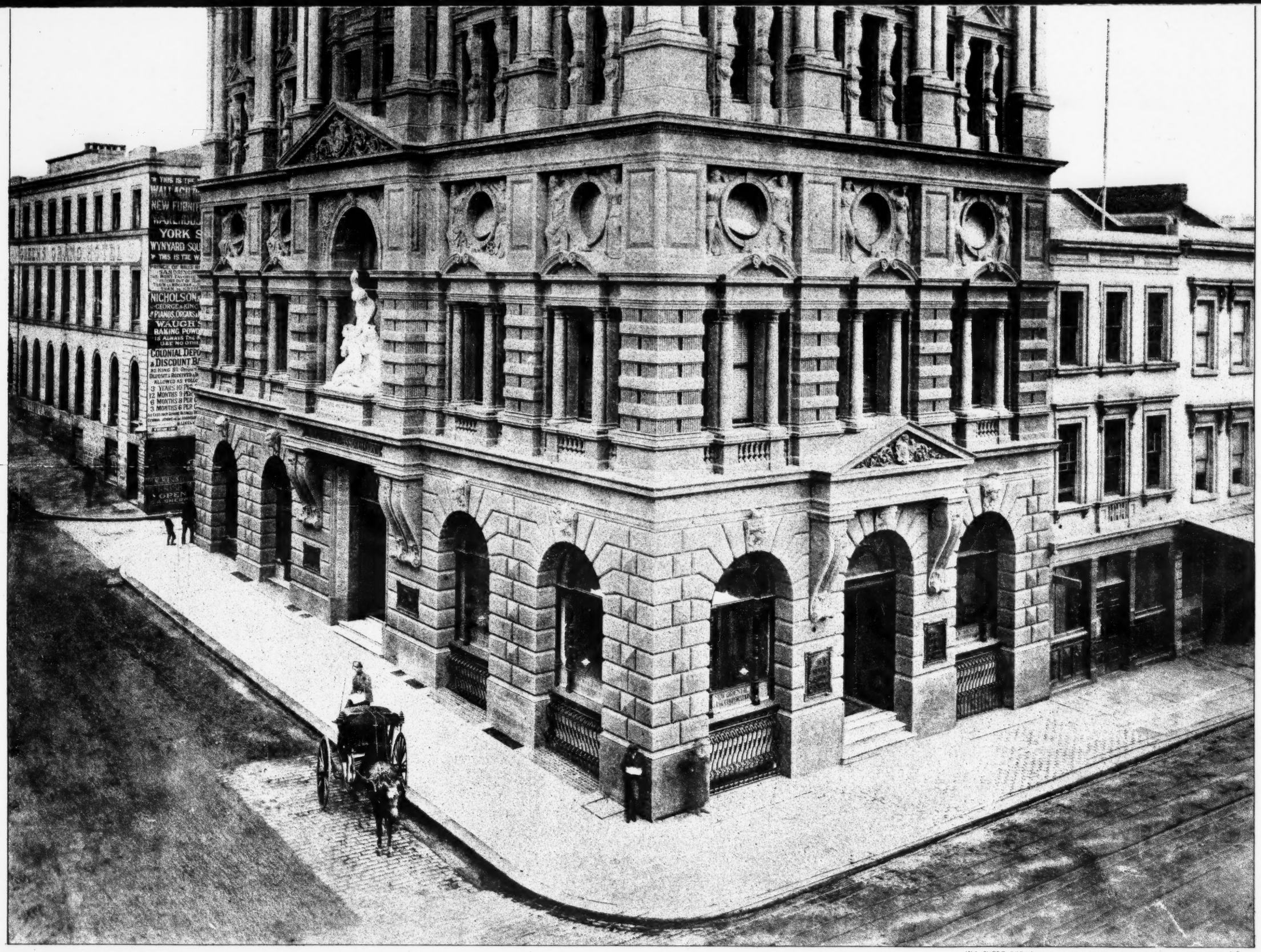

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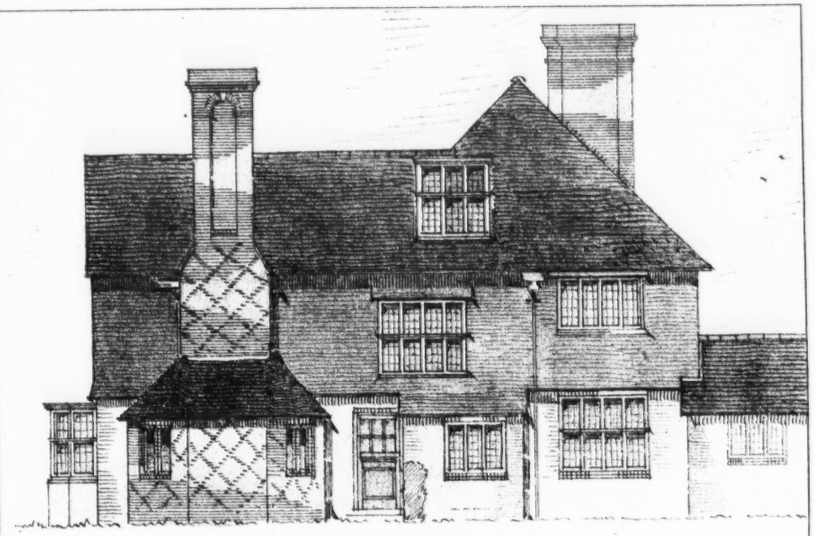

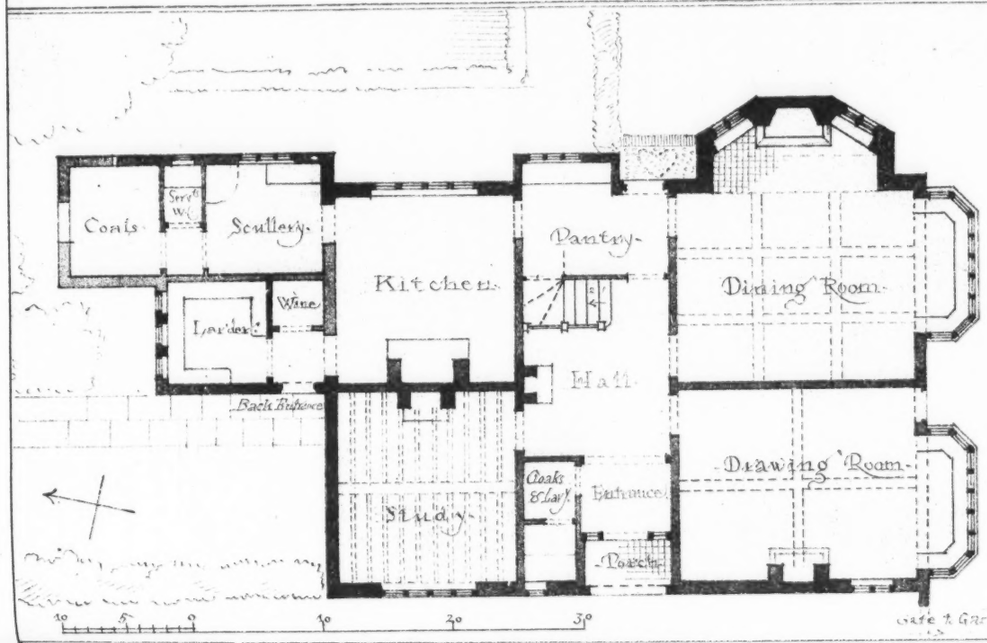

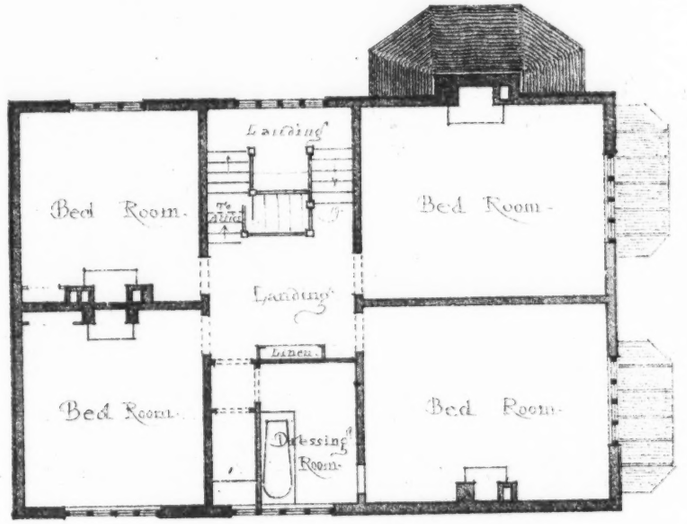

Design for a Small Country House: Ground & First Floor Plans: & Elevations: Gerald: C. Horsley: Architect.

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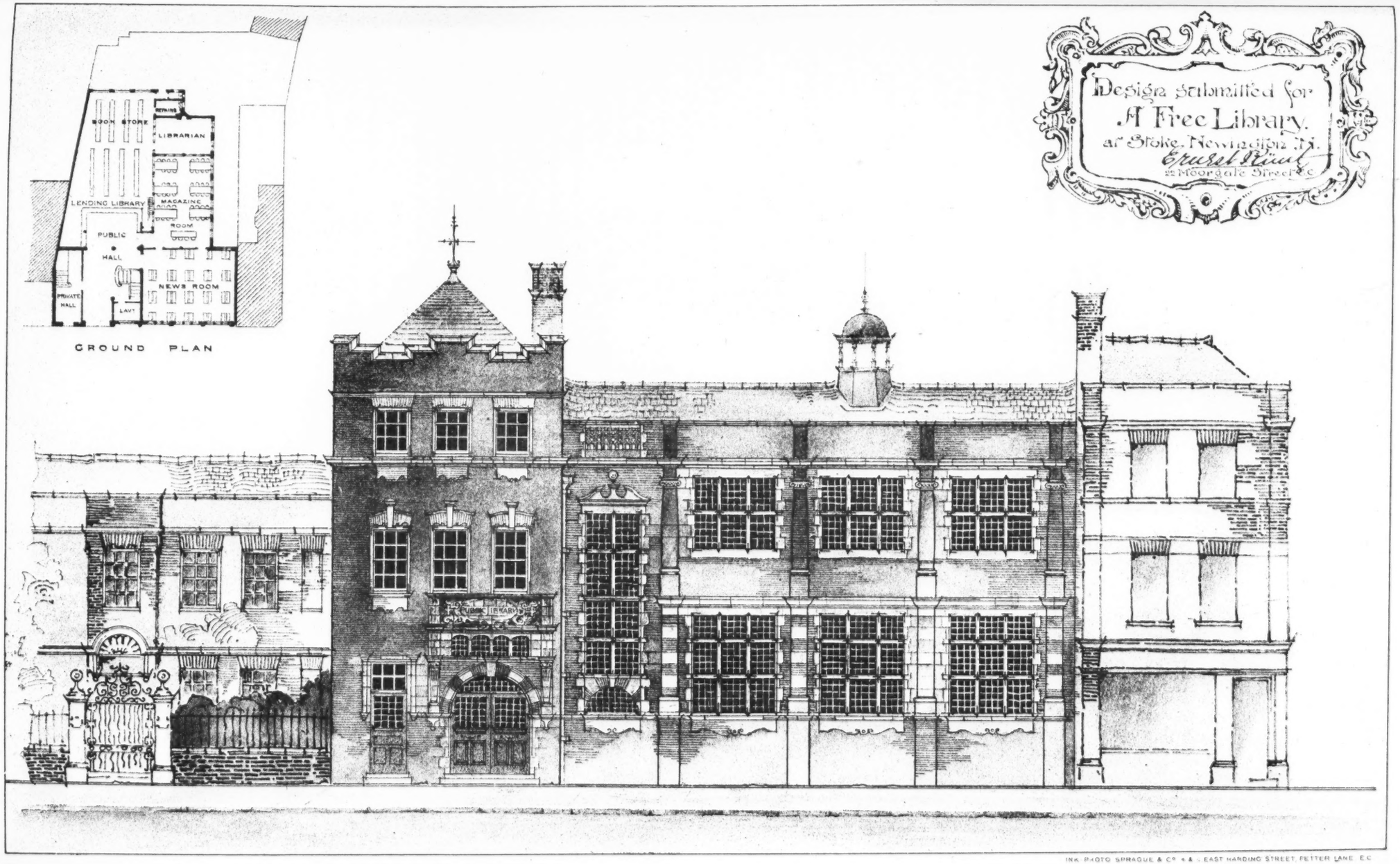

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Royal Academy Exhibition, 1892.

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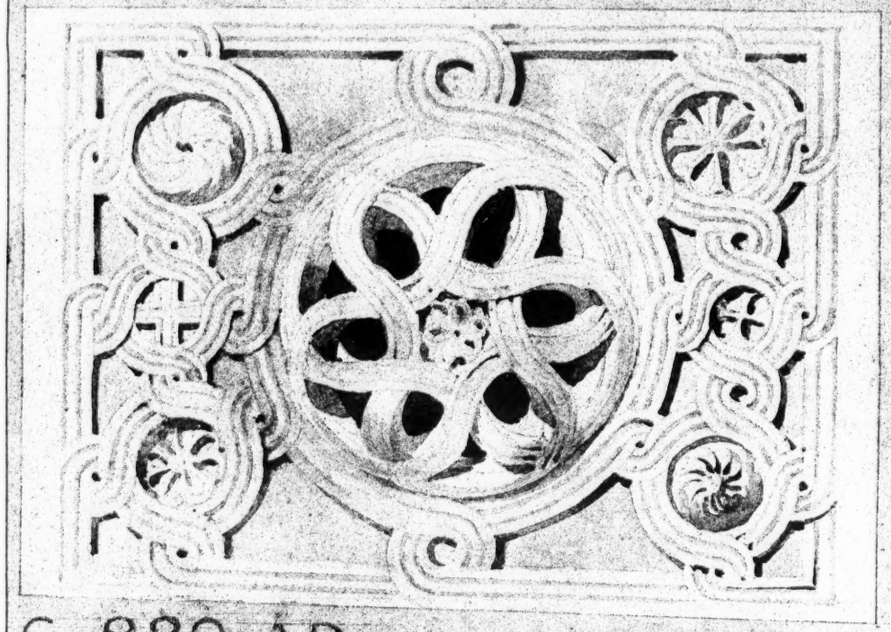

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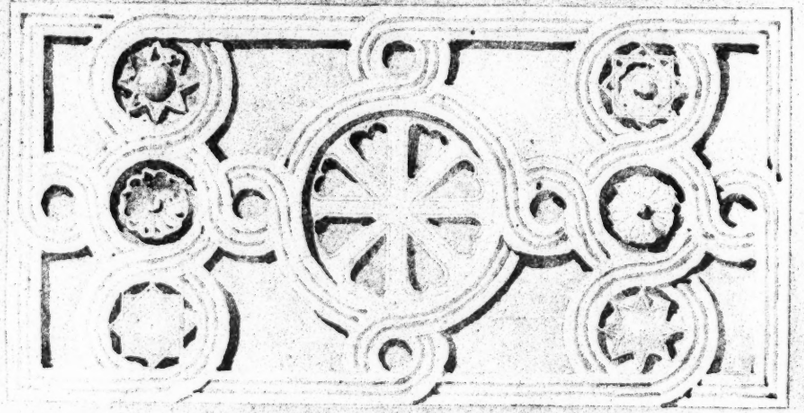

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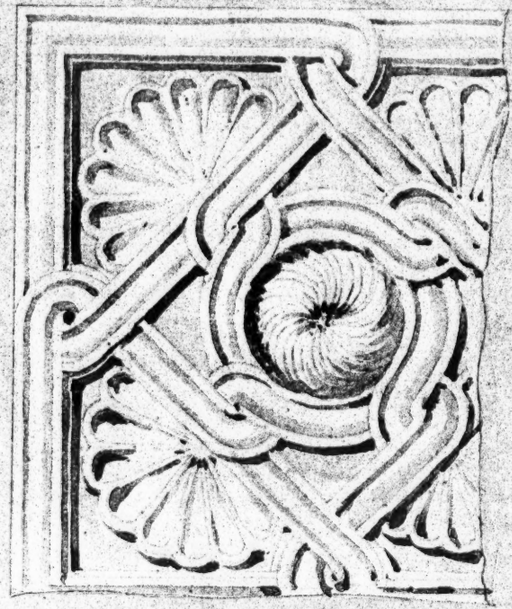

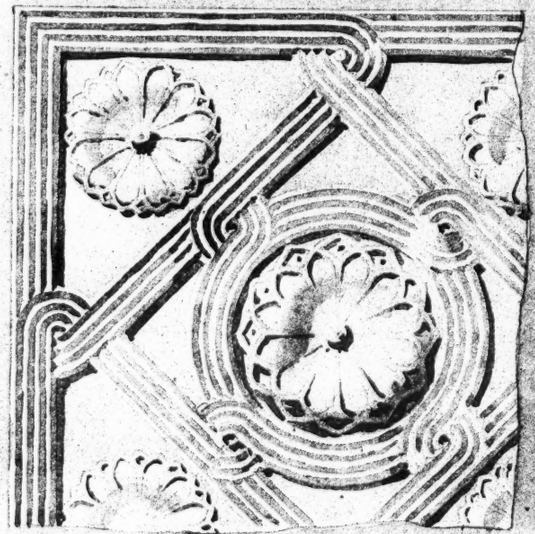

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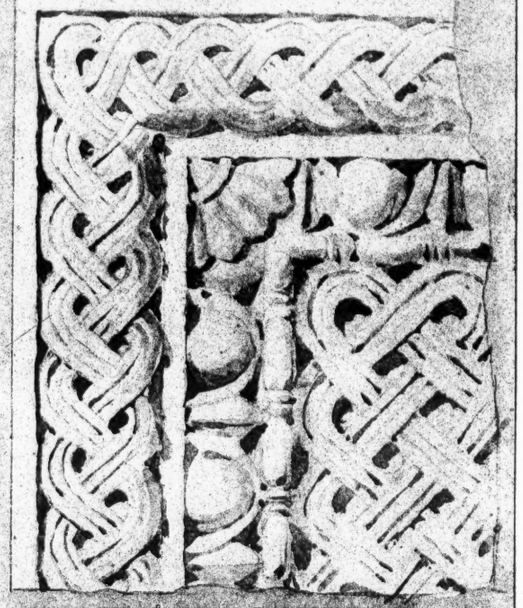

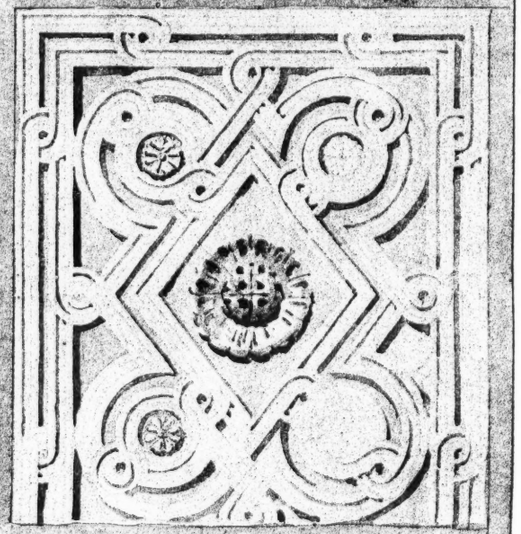

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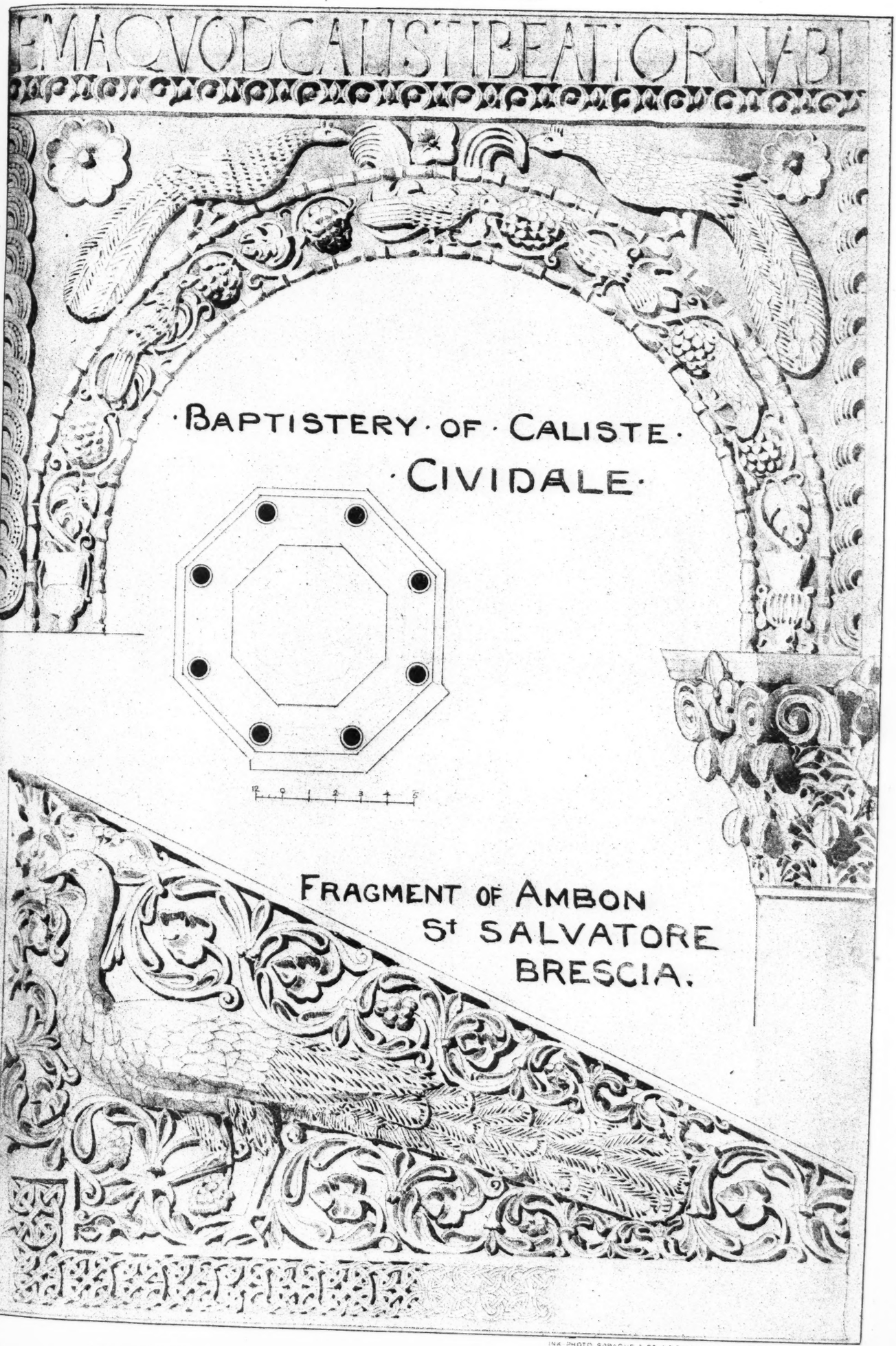

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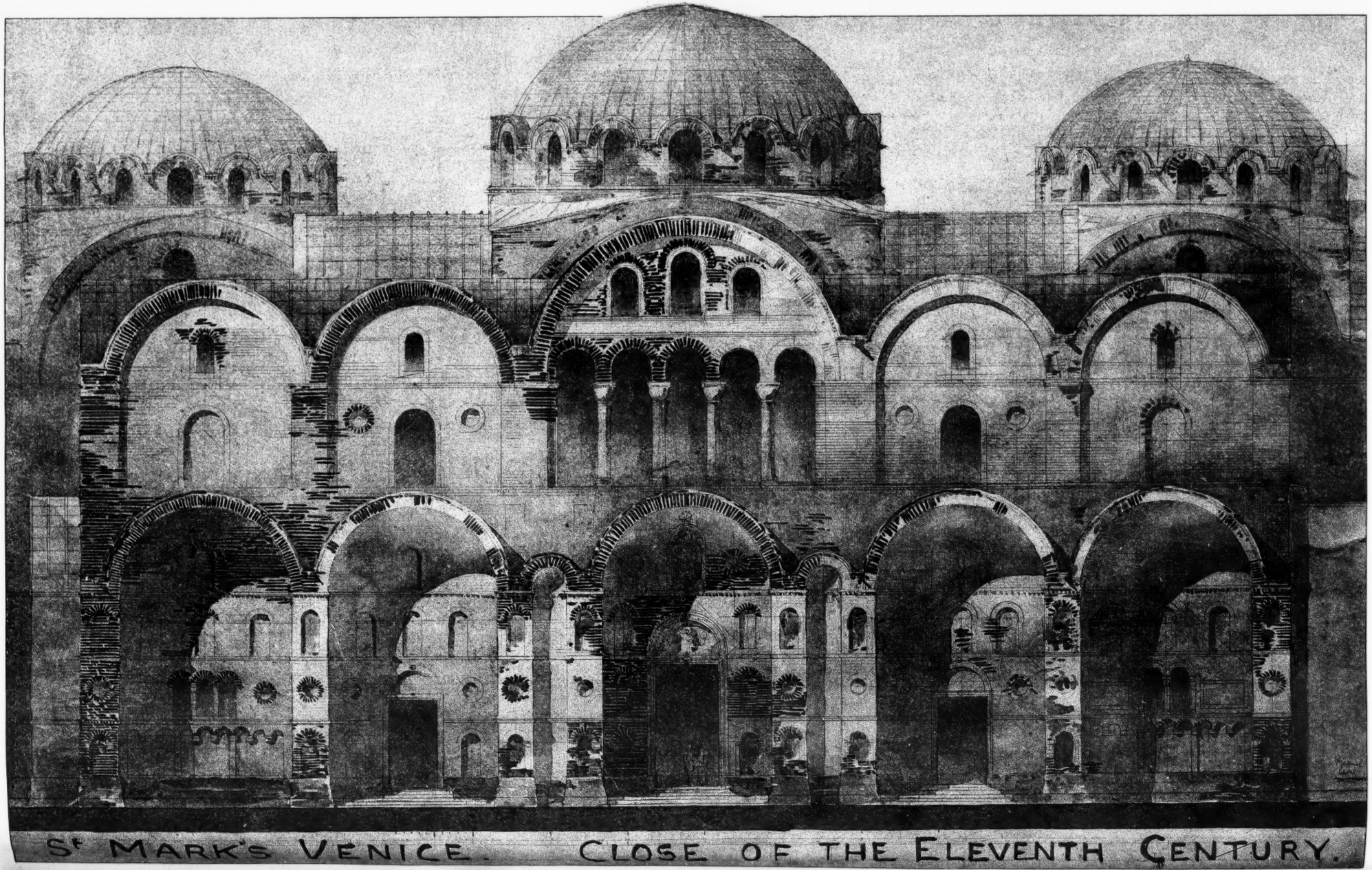

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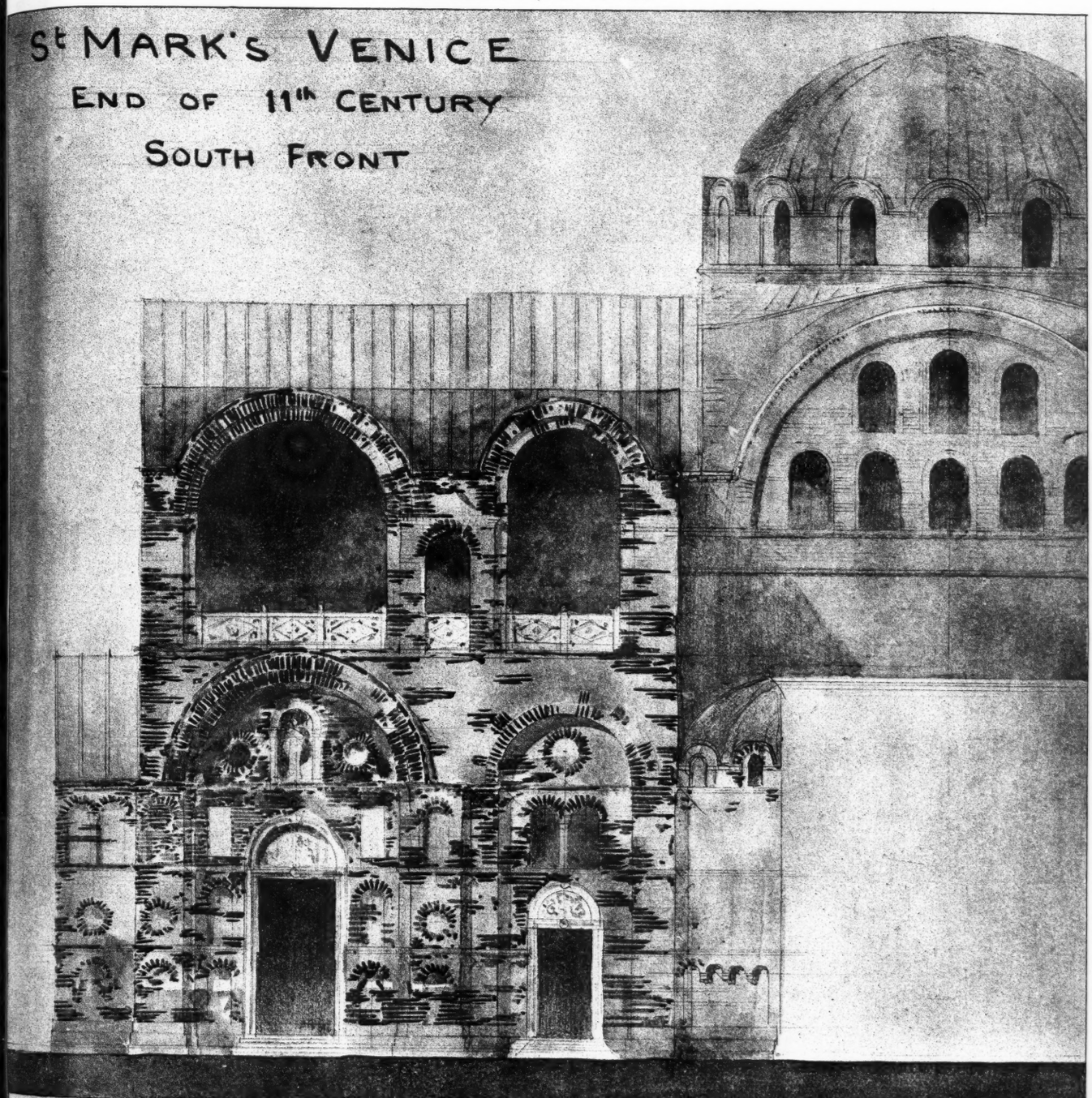

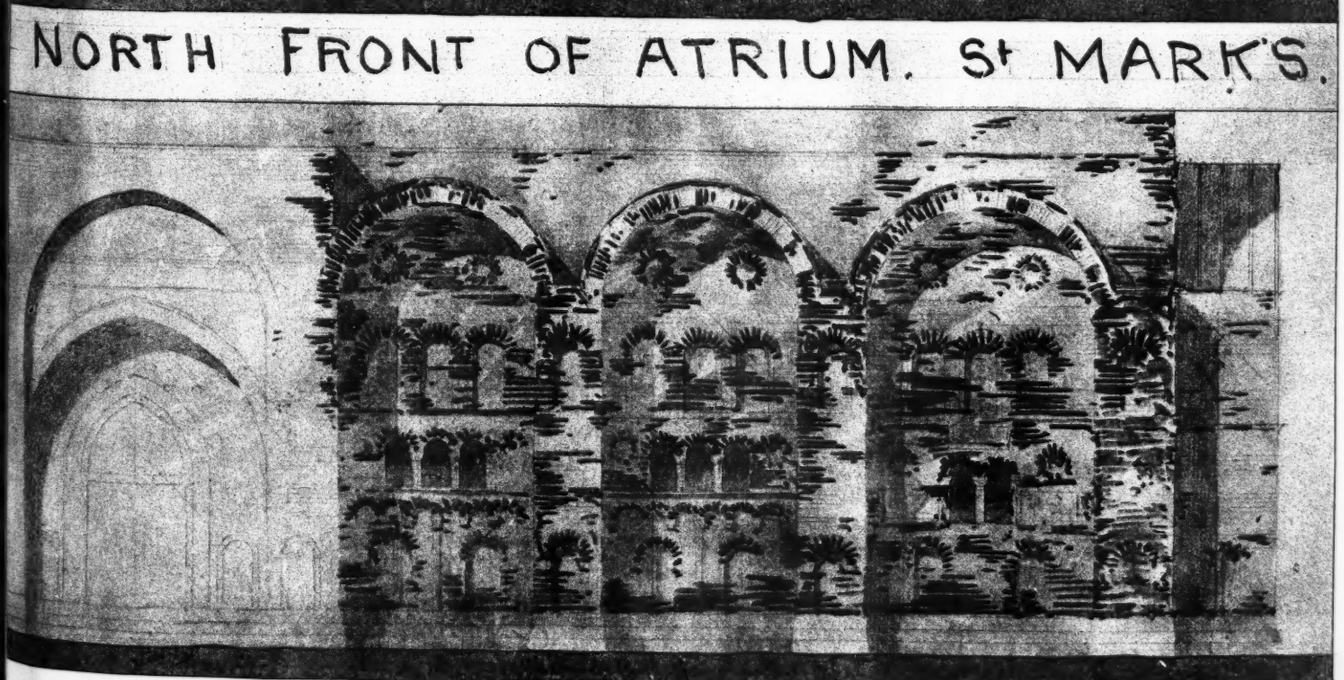

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